Technical Report 1156

Surrogates for Future Force Warrior (FFW) Training Research

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March 2005

United States Army Research Institute for the Behavioral and Social Sciences

U.S. Army Research Institute for the Behavioral and Social Sciences

A Directorate of the Department of the Army Deputy Chief of Staff, G1

ZITA M. SIMUTIS
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Research accomplished under contract
for the Department of the Army

Northrop Grumman Mission Systems

Technical Review by

Michael J. Singer, U.S. Army Research Institute
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NOTICES

REPORT DOCUMENTATION PAGE

1. REPORT DATE (dd-mm-yy)	2. REPORT TYPE	3. DATES COVERED (from. . . to)
March 2005	Final	June 2004 – January 2005

4. TITLE AND SUBTITLE	5a. CONTRACT OR GRANT NUMBER
Surrogates for Future Force Warrior (FFW) Training Research	DASW01-99-D-0013 DO#34
	5b. PROGRAM ELEMENT NUMBER 622785

6. AUTHOR(S)	5c. PROJECT NUMBER
Stephen C. Livingston, James T. Root, and Ronald L. Mast (Northrop Grumman); and Patricia A. Gilbert (Columbus State University)	A790
	5d. TASK NUMBER 215
	5e. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)		8. PERFORMING ORGANIZATION REPORT NUMBER
Northrop Grumman Mission Systems 99 Pacific Street Suite 255A Monterey, CA 93940	U.S. Army Research Institute for the Behavioral and Social Sciences Infantry Forces Research Unit PO Box 52086 Fort Benning, GA 31995-2086	

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. MONITOR ACRONYM
U. S. Army Research Institute for the Behavioral & Social Sciences 2511 Jefferson Davis Highway, Arlington, VA 22202-3926	ARI
	11. MONITOR REPORT NUMBER Technical Report 1156

12. DISTRIBUTION/AVAILABILITY STATEMENT

Approved for public release; distribution is unlimited.

13. SUPPLEMENTARY NOTES

Contracting Officer's Representative: Kenneth L. Evans. Subject Matter POC: S. Livingston

14. ABSTRACT *(Maximum 200 words)*:

This report describes the design, organization, and capabilities of a new U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) Warfighting Experimentation Lab at Fort Benning, Georgia. It was developed to provide the ARI staff with a reach forward ability in training research. As the DoD Training Transformation (T2) gets underway, the Army is now working on its transformation as an ongoing perpetual function. Because of the flux inherent in perpetual transformation, many of its proposed future developments are and will continue to be abstract with varying kinds and amounts of related empirical data. Thus there was a need for the Warfighting Experimentation Lab to provide a flexible simulation environment in which researchers can examine proposed and evolving tactical technologies and innovations. A major design consideration for the ARI facility was to mirror the equipment in the Infantry School's own Simulation Center, using parallel surrogate equipment.

15. SUBJECT TERMS

Simulation Training Development Future Force Warrior

SECURITY CLASSIFICATION OF			19. LIMITATION OF ABSTRACT	20. NUMBER OF PAGES	21. RESPONSIBLE PERSON
16. REPORT	17. ABSTRACT	18. THIS PAGE			
Unclassified	Unclassified	Unclassified	Unlimited		Ellen Kinzer Technical Publication Specialist (703) 602-8047

Standard Form 298

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March 2005

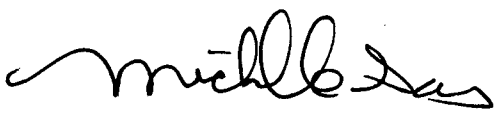
Army Project Number
622785A790

Personnel Performance
and Training Technology

FOREWORD

The U.S. Army is currently undergoing a rapid and far-reaching transformation process in organization, equipment, and technology. Two current programs within this transformation are the Future Combat Systems (FCS) and Future Force Warrior (FFW) (formerly known as Objective Force Warrior), which seek to identify and field a variety of new systems designed to enhance Soldier and leader and unit tactical effectiveness. Based on extensive experience in innovative training research and development methods, the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) Infantry Forces Research Unit (IFRU) at Fort Benning, Georgia determined a need for an experimentation lab where state of the art training research could be conducted in support of the DoD and Army transformation process.

This report describes the design, organization, and capabilities of the new ARI Warfighting Experimentation Lab. In essence, the lab represents a "reach forward" concept in training research. Many of the FCS, FFW, and associated initiatives remain on the drawing boards with their specific designs and utilities subject to change. The challenge is to be able to address these new developments as they take shape and firm up by conducting applied research experiments using parallel surrogate technologies. The Warfighting Experimentation Lab was designed to provide a flexible environment allowing researchers to analyze the uses, at Soldier level, of a variety of evolving tactical technologies and innovations. There are currently two new FFW-related science and technology objectives (STO) that are being planned for the experimentation lab, with more to follow.



MICHELLE SAMS
Technical Director

SURROGATES FOR FUTURE FORCE WARRIOR (FFW) TRAINING RESEARCH

EXECUTIVE SUMMARY

Research Requirement:

The U.S. Army is in the midst of an extensive, rapid, and ongoing transformation process, which is having a dramatic effect on tactical operations, doctrine and training program design. The focus on joint integration, the reorganization of brigade combat teams, and the Future Force Warrior (FFW)(formerly known as Objective Force Warrior) and Future Combat Systems (FCS) initiatives are all driving these changes down to the individual Soldier. At the Soldier's level, it is imperative that the capabilities of equipment, networked systems, and organization can be effectively trained and utilized.

This report describes the design, organization, and capabilities of the Warfighting Experimentation Lab. In essence, the lab represents a "reach forward" concept in training research. Many of the FCS and FFW and associated initiatives remain on the drawing boards with their specific designs and utilities still developmental. The challenge was to be able to address these new developments as they begin to solidify and conduct applied research experiments using parallel surrogate technologies. The Warfighting Experimentation Lab was designed to provide a flexible environment allowing researchers to analyze the uses, at Soldier level, of a variety of evolving tactical technologies and innovations.

Procedure:

Though several potential vehicles were explored, the simulation environment that was selected offered a more comprehensive approach and could more accurately reflect actual new equipment and developmental features. It was decided the best approach would be to mirror the desktop systems already in use at the Fort Benning Simulation Center. This set up would allow easier coordination for collaborative research between ARI and the Simulation Center.

The Warfighting Experimentation Lab consists of ten desktop computers, networked together through a central hub. Four of the desktops are designated as Soldier Stations, and the remainder are control stations. The control stations operate the Battle Master, the Digital Audio Control Station (DACS), the Virtual Soldier Simulation Assessment (ViSSA), and One Semi-Automated Forces Test Bed (more commonly referred to as OneSAF OTB) Version 1. OTB Version 1 was used due to incompatibilities between the ViSSA software and Version 2 of the OTB. The Soldier Stations and the Battle Master Station primarily run Advanced Interactive Systems (AIS) Soldier Visualization System (SVS) Version 2.1. A more complete description of the system can be found in the Warfighting Experimentation Lab Users' Guide at Appendix A.

This design offered a variety of potential simulation capabilities at the squad, platoon, and company level and was flexible enough to integrate new applications such as organic robotics and enhanced fire support features. In addition, tactical functions and teams could be tailored to incorporate evolving developmental concepts, unit organization, and equipment enhancements.

The entire system was tested in November, 2004, using the Sample Exercise Plan in the Users' Guide. A person in the role of either platoon leader or squad leader occupied each station. A Battle Master who also fulfilled the roles of company commander and the fire support cell controlled the exercise. The OneSAF OTB was operated by a consortium fellow who is a computer programmer and responsible for the overall day-to-day operation of the lab. This person also ran ViSSA, to include preprogramming critical points and actions, and manually recording events in ViSSA when required.

Findings:

During the test some problems arose through a lack of previous experience with the integration of such a complex system and a lack of complete knowledge of the capabilities of the SVS and OTB Version1. It was thought that we would be able to attach computer generated forces (CGF) to the SVS squad leader and have them move based on the squad leaders movement. Such was not the case, and the OTB operator had to move them via the OTB. Because the exercise was phased it was discovered that CGF for both Blue Forces and Opposing Forces were doubled, exceeding the capability of OTB Version 1, which is 300 entities. There were a total of 500 entities involved in the exercise. The high number was caused by the fact that each 9-man squad actually represents 9 entities, and if there are two phases that number doubles to 18. There were a total of 5 Blue Force platoons, with their associated Stryker vehicles, which resulted in 155 entities, which totaled 310 entities due to phasing. This number did not include the Opposing Forces, which totaled approximately 220 entities. The additional platoons portrayed units to the flanks of the subject platoon and those in reserve. The total of 530 entities also caused the entire integrated system to run extremely slow.

Problems such as these have been overcome through continued research and practice. Other areas that presented minor problems have been resolved through experimentation with the software and more practice.

Utilization of Findings:

The Warfighting Experimentation Lab discussed in this document allows the ARI research team an opportunity to explore the utility of proposed designs prior to or early in the fielding process for systems such as Future Force Warrior and the inherent tactics, techniques, and procedures, as well as the development of training and doctrine. Insights acquired from such examinations can help identify any needed refinements, determine better ways to integrate the changes, and form the basis for further development and/or research.

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SURROGATES FOR FUTURE FORCE WARRIOR (FFW) TRAINING RESEARCH

Introduction

The U.S. Army is in the midst of an extensive, rapid, and ongoing transformation process, which is having a dramatic affect on doctrine, training, and tactical operations. The focus on joint integration, the reorganization of brigade combat teams, and the Future Force Warrior and Future Combat Systems initiatives are all driving these changes down to the individual Soldier. At this level, it is imperative that the capabilities of equipment, networked systems, and organization be effectively utilized. (Mayberry, 2003)

The mission of the infantry company is generally the same as it has always been: kill, capture, or destroy the enemy. The environment in which this is accomplished, however, is being significantly altered. In response to an asymmetrical enemy and a fluid tactical picture, enemy intentions, capabilities, and center of gravity have acquired new dimensions. We are no longer preparing for a 15 round slugging match between two heavy weights, but a marathon likely run by small independent forces through hostile urban mazes dominated by a resident and elusive enemy.

While the terrain may be historically familiar, the geography of the battlefield is being redefined to accommodate the vast technical edge that we can now begin applying. Occupied space, which previously meant massed formations, now requires fewer Soldiers, operating with greater autonomy and separation than ever before, and commanding ever-expanding acreage. Ironically, despite more distance between them, Soldiers and teams are less isolated than ever before. This is the leverage gained by the technological communications network that can provide an umbrella of immediate support to the furthest combat element (under the DoD Transformation concept of net-centric warfare). (DoD, 2004)

Crushing firepower is always helpful, but victory historically belongs to the smartest and toughest guy in the street. Since the American Soldier is already both tough and smart, the issue becomes how much better can we make him. Or stated another way, what is the most appropriate and effective way to integrate the potential new technologies with the Soldiers and leaders who will employ them?

In the past, raw talent coupled with an intense, but short, training period prepared Soldiers and their immediate leaders for their roles. These roles, though, have been vastly extended and the introduction of multiple new systems may compound the training time in ways we don't fully grasp before actual combat is experienced. In this regard, the time dimension can be addressed in terms of input – process – output, which for a small unit leader means: How fast he can collect and absorb the essential information; how rapid is his decision cycle; and how well can he execute?

As the pace of the Army's transformation increases, so does the complexity of simultaneously fielding and integrating the five major elements of doctrine, organization, technology, personnel, and training. The more compact and mobile brigade combat teams that are being organized represent a significant departure from an Army that has historically been built around a divisional structure. To make these new brigades work, there is a fundamental shift from muscle to technology.

Cornerstone systems such as the Force XXI Battle Command at Brigade and Below (FBCB2) and Blue Force Tracker (BFT) provide Soldiers and leaders with an operational picture unheard of a decade ago. Enhanced visual, sensor, signal, and communications devices provide superior connectivity capabilities. This, in turn, has led to revolutionary changes in a variety of areas. The fire support arena, in particular, has become more responsive to increasingly lower echelons and more decisively lethal in its application. Artillery and air support systems are evolving from area weapons to precision weapons. Coupled with this is the introduction of robotics, the proliferation of UAVs, and other networked tactical systems still on the drawing boards. Computers, now with wireless capability, have moved from headquarters to the Soldier. These are huge and rapid advances, and are far more than just a better rifle or a newer helmet. They represent an increasingly complex environment. Used effectively, they will allow us to master any battlefield. If used ineffectively, they become a burden instead of a combat multiplying asset. It is imperative to understand the individual and collective tasks that Soldiers must master, how to train them in the most effective manner, and be able to continually evolve to meet the needs of the Soldier and accomplish the mission.

Errors, disconnects, and mistaken paths occur in any transformation. Obviously, in an organization as large and complex as the Army, engaged in a war with the globe as its battlefield, the fewer missteps, the better. Resource considerations alone demand that we approach this challenge as efficiently and effectively as possible. Leaders and trainers must anticipate problems before systems are fielded in order to ameliorate the effects of those problems before Soldiers start training with the systems. This can best be accomplished through experiments with tactics, techniques, and procedures; and through human behavior and training experiments.

The ARI Infantry Forces Research Unit at Fort Benning is exploring some of these training issues seeking to understand the capabilities and limitations of proposed infantry subsystems and their training interrelationships. These efforts can provide valuable information and insight into the techniques and processes necessary to integrate the Soldier's training with the new technologies. (Evans, 2002)

In addition, methodologies are being examined that can assist commanders and trainers to rapidly determine what does or doesn't work, and identify whether the problem lies with the Soldier, the equipment, or both. This is critical since once these evolving technologies are incorporated into tactical training it will become increasingly difficult to isolate and define the problem. Since the final objective of these new technologies is to make the force more effective, it is incumbent upon the Army to ensure

training is equally effective. This project is a step toward that end. (Graham and Dyer, 2002)

Concept Design

The FCS and FFW initiatives incorporate a number of evolving technologies and concepts to enhance Soldier combat effectiveness. As each component of these new systems is adopted, it is integrated with existing equipment and systems. In order to ensure the viability and value of these additional components, it is valuable to not only examine the physical and technical design, but the human training variables necessary for successful application of the systems.

Because the FCS and FFW programs are still evolving in their design and implementation, the framework in which training development research can be conducted requires enough flexibility to accommodate the dynamic and fluid nature of their development and fielding. This allows a number of training strategies to be developed based on experience and the analysis of the development, fielding, and training for previous technologies and systems. Critically, these strategies must relate to the knowledge base of Soldiers and trainers. These strategies must identify effective training and enabling techniques to allow the integration and sustainment of new knowledges and skills required by such radically new technologies. (Barrera and Grizio, 2003)

Our first step in this project was to determine the specific vehicle that would provide the greatest insight into how best to apply these new systems and identify any refinements that might be beneficial. Initially it was thought that field-training systems might provide a viable approach; however, since much of FCS and FFW is still conceptual, it was difficult to know how to configure surrogate equipment to adequately replicate future designs.

The simulation environment offered a more comprehensive approach that could be more easily modified to accurately reflect actual equipment and developmental features. While several potential systems were explored, we decided the best approach would be to mirror systems already in use at the Fort Benning Simulation Center. This would make it easier to coordinate future collaborative research programs between ARI and the Simulation Center.

Implementation

Laboratory Environment

The Simulation Center at Fort Benning is a substantial facility capable of offering training in a simulated tactical environment to individual Soldiers, staffs, and everything in between. This capability, however, was far too broad for research purposes and much too expensive to replicate on a similar scale. It was necessary to narrow the scope of the proposed research Warfighting Experimentation Lab to more specifically defined parameters.

After reviewing several options, a configuration consisting of four stations, a controller station, and a research station was determined to be the best fit. This organization offered a variety of potential uses at the squad, platoon, and company level and was flexible enough to integrate new applications such as organic robotics and enhanced fire support features. In addition, tactical functions and teams could be tailored to incorporate evolving developmental concepts, unit organization, and equipment enhancements.

The site selected for the Warfighting Experimentation Lab was in the basement of McVeigh Hall (Building 75) at Fort Benning, which had previously been used by ARI for experiments in night vision devices. The facility required additional electrical circuits, amperage, and outlets to accommodate the increased computer load. Building 75 was originally built in the late 1930's and the structure was such that the use of cellular phones is not possible, so telephone service had to be added. This was especially critical when technical support from vendors was required. The location was isolated and self-contained significantly reducing or eliminating distractions during the conduct of experiments.

Hardware Configuration

The Warfighting Experimentation Lab consists of ten computers, a network hub, a simulated radio system, and an after action review/data retrieval system. There are four Soldier stations that consist of Dell ®Dimension 8300™ computers with a 3 gigahertz (GHz) Pentium 4 processor, equipped with two partitioned drives with 112 gigabytes (GB) of storage space, 1GB of Random Access Memory (RAM), a combined digital video drive (DVD) and compact disc rewritable (CD-RW) drive, a SoundBlaster® compatible soundcard, two network interface cards (NIC), an 18 inch flat screen flat panel monitor, and a 128MB PCI Express™ x16 ATI Radeon™ X300 SE graphics card. Each station is also equipped with a headset and individual controller for the simulated radio system. Stations 6 and 8 are equipped with a remote interface unit (RIU) and Stations 2 and 8 have a hand-held terminal (HHT) for the simulated radio system. Each computer has standard software, Microsoft Office 2000 ®, and the Advanced Interactive Systems ® Soldier Visualization System™ (SVS) installed. The operating system (OS) is Windows XP Professional Edition®. Station 8 will always be the senior leader's station.

Control Stations. There are six control station computers. Four are identical to the Soldier workstations with the following exceptions:

- Station 1 is the Battle Master station and has the Battle Master SVS software installed which allows attachment of entities, and operation in the stealth mode. Station 1 also has an RIU, HHT, and headset.
- Station 2 is the OneSAF OTB station. It does not have SVS installed, but rather Version 1 of OneSAF OTB. Instead of Windows XP Professional® as an OS, Station 2 uses Linux Red Hat Version 9.0 ™ as the OS in order to run the OTB. Station 2 also has a radio simulation system consisting of the headset and HHT.

- Station 3 is the audio logger computer and stores all the simulated radio system traffic. It is a Dell 8300 identical to the Battle Master station. It has the ability to receive data from the Digital Audio Control System (DACS) to record the audio transmissions and data.
- Station 4 is the logger station. It is identical to Station 1, except that it stores the data created by the Virtual Soldier Simulation Assessment (ViSSA) computer. It has no simulated radio system.
- Station 9. The computer at the center reverse of the console is the DACS. It is the primary integrator of communications traffic, and must be programmed with a communications model (done by the OneSAF OTB operator) for each scenario. The monitor and keyboard for the DACS are collocated with the DACS. The Advanced Simulation Technologies, Inc (ASTi) simulated radio system also consists of four remote interface units, which currently handle two individual headsets with push to talk buttons, volume control, and headsets. The entire system works through the second network interface card mounted in each computer that is on the simulated radio network. There are also three hand held terminals that control frequencies, power, and reception and transmissions.
- Station 10. The computer at the far end of the control bank is used to capture selected events. It must be programmed to capture unique events by the OTB operator. It has the ViSSA assessment tool installed.
- Network Hub. The network hub, co-located with the DACS computer, connects all the stations and computers together.

Software Configuration

The operating system for the majority of the computers is Windows XP. The only exception is the station that runs OTB, which requires Linux Red Hat as an operating system.

The software exercise configuration and simulation software includes four licenses of Version 2.1 of the Soldier Visualization Station (SVS), for desktop computers, developed by Advanced Interactive Systems, Inc. (AIS). Two stations have licenses for the Battle Master version of the SVS. (AIS, 2002). The Virtual Soldier Skills Assessment (ViSSA) software package was obtained from ScenPro, Inc. to record data from simulation exercises so that data could be captured and reviewed for analysis. (ScenPro, 2004). ViSSA and OTB Version 2 were not compatible and caused system and network problems. As a result the lab had to revert to OTB Version 1, which was provided by the government. (PEO STRI, 2000).

The ASTI radio communication system was installed by ASTi personnel and has operated without difficulty. After the test exercise, it was necessary to make volume adjustments on background noise, which was too loud; however this was a fairly simple process to accomplish.

The entire system communicates and exchanges data via the Distributed Interactive Simulation (DIS) protocol, or Institute of Electrical and Electronics Engineers protocol 1995 (IEEE 1995). There are two forms of simulation information exchange, DIS and High Level Architecture (HLA). DIS compliant simulations have been used extensively in recent automated Warfighting exercises. DIS compliant programs send data through the network by electronic packets, and allow non-DIS compliant interfaces and software to share information. This capability is especially important in the lab, which enables ViSSA, SVS, and OTB to share information. DIS compliant programs are also more tolerant of host failures and generally will allow the overall simulation to continue operations. (White, Frosch, Laviano, Hieb, and Pullen, n.d.)

Test Exercise, November 2004

By October 2004 the lab was completed, with all components installed and the electrical supply upgraded. Individual components had been tested, but the entire system had not yet been exercised to determine how well it worked, or where problem areas might be revealed under the load of a full exercise.

The exercise staffing consisted of a retired Infantry officer acting as the battle master, a retired Infantry officer acting as the platoon leader, a retired Infantry NCO acting as the 1st squad leader, an ARI consortium fellow without military experience acting as the 2d squad leader, and an ARI research scientist without military experience acting as the 3d squad leader. The OTB and ViSSA operator was an ARI consortium fellow, who had programmed the exercise into OTB, and made some model changes within SVS to meet the scenario requirements.

The scenario consisted of a Stryker battalion conducting an assault from north to south, dismounted, during hours of darkness, to seize and secure the airfield north of McKenna, and the terrain south of McKenna. Other platoons on the left and right flank of the platoon being exercised were represented by computer-generated forces (CGF), and were given objectives similar to the exercise platoon. In the scenario the platoon leader had an FFW armed reconnaissance vehicle (ARV) at his disposal. Since there is no ARV in OTB or SVS, a model of a different looking vehicle that was small and armed was downloaded from the Army Model Exchange. The integration of OTB and SVS proved that there was a shortfall in the kinds of models required, especially for FFW experiments.

Prior to the exercise beginning, it was discovered that OTB Version 1 would not allow more than 300 entities on the virtual battlefield to be saved. As a result, the OTB computer was left running after it was programmed to keep the 520 entities that were in the exercise. Entities are each and every virtual Soldier and piece of equipment on the battlefield. For example, an Infantry squad of 10 Soldiers is not one entity it is 10 entities. Additionally, if the OTB scenario were split into two phases to help simplify programming the first and second phase replicated each entity, therefore doubling them. For example, if there were 250 entities in Phase I, those same 250 entities would be replicated in Phase II, creating a total of 500 entities. It was learned at a later date that scenarios should be limited to 100 entities, or additional OTB servers be added to the lab.

As SVS dismounted Soldiers approached OPFOR or BLUFOR vehicles, the sound from them at idle was deafening. It was very hard to hear simulated radio traffic as a result, and finally the simulated radio system was abandoned in favor of "just talking across the room."

During the course of the exercise the whole system ran very slowly and refreshed virtual objects slowly. Large equipment like the helicopters could not be seen until the SVS Soldier was right on top of them. It was learned later that this is a function of substitute models from the Army Model Exchange and is based on the enumeration tables for the original models that were replaced. Binoculars and night vision capabilities were not available because they were not programmed. The preponderance of opposing forces was destroyed by preplanned artillery and an air strike. Highly accurate and devastating fires from the opposing force also decimated blue forces. While the ARV was quickly destroyed by gunfire, the opposing force 'technical' vehicles were invulnerable to gunfire, and were finally destroyed by firing two Javelins at each. CGF squads would not automatically follow the squad leaders.

At the end of the exercise the ViSSA logger computer malfunctioned and locked up. An after action review was conducted at the end of the exercise to discuss and find solutions for the problems that were encountered before, during, and after the exercise.

Problem Solutions

Solutions were found to all these problems. The test exercise had flank units (which also got in the way at one point of the exercise), which contributed to the high number of entities. Because the exercise was in two phases, the number of entities doubled. To avoid this in the future the overall system was upgraded to OTB Version 2, and the total number of entities will be kept to about 100, and exercises will not be phased. With 100 entities the system will run faster and refresh objects on the synthetic battlefield faster, allowing SVS Soldiers to see them from further distances. The binocular and night vision equipment in the Soldier Stations has been reprogrammed to allow the use of these devices, which will help prevent them from getting lost or committing fratricide. Prior to the next exercise small posters will be put up in the lab identifying Blue forces, opposing forces, and civilians on the battlefield to help preclude fratricide.

While additional models have been found at the Army Model Exchange, they do not always work the way they are suppose to in the SVS viewer. Some take on the appearance that they are both destroyed and good, some do not show up on the screen at all. These problems have not been solved, however; it has been possible to have 3D models custom made on a case-by-case basis with great success. The lab has been able to include the iSTAR organizational aerial vehicle and the TALON small unmanned ground vehicle. The iSTAR was obtained from both the Army Model Exchange and AIS. The TALON was custom made for a follow-on experiment to be conducted in the lab.

To solve the overwhelming and highly accurate fires from opposing force CGFs, the efficiency ratings, which are adjustable, will be changed to 80 percent for Blue forces,

and 30 percent for opposing forces. During some follow on experiments, this ratio seemed to provide a more level "playing field" concerning fires. It was also learned that when vehicle models are replaced, that they should replace like vehicles. The problem with the vulnerability of the ARV, which was destroyed by the OPFOR very quickly in the exercise, was that it replaced a type of vehicle that was soft skinned and easily defeated by small arms fire. The exact opposite was true of the opposing force 'technical' vehicles. They had replaced the Soviet style BRDM armored scout vehicle, making them impossible to kill with small arms fire.

The deafening background noises experienced in the ASTi simulated radio system were easily fixed by adjusting the volume for background noises while maintaining the level of volume for radio traffic. It is believed that the ViSSA logger computer locked up at the end of the exercise due to the inordinate amount of entities on the synthetic battlefield, and its efforts to track and report on the status of each one. By reducing the overall number of entities represented during an exercise, this problem should not arise again. It is almost a certainty that other problems will be experienced while operating the lab; however, as experience is gained in its use, solutions will be found.

Conclusions

The lab will continuously improve in its function and capabilities as more experience is gained in the use of the entire lab and each of the individual components of the lab. Currently the lab is scheduled for the conduct of an exercise for Future Force Warrior to determine the differences between cognitive learning and formal training in Troop Leading Procedures and conducting an assault on an urban objective for lieutenants who have completed the Infantry Officer Basic Course. That experiment and others like it will help the FFW training team, of which ARI is the government co-lead, determine what amount of formal training will be required for selected FFW tasks in the Infantry School and other TRADOC schools. It is also possible that the lab can be used to help test and validate tactics, techniques, and procedures for other FFW tasks as part of that effort.

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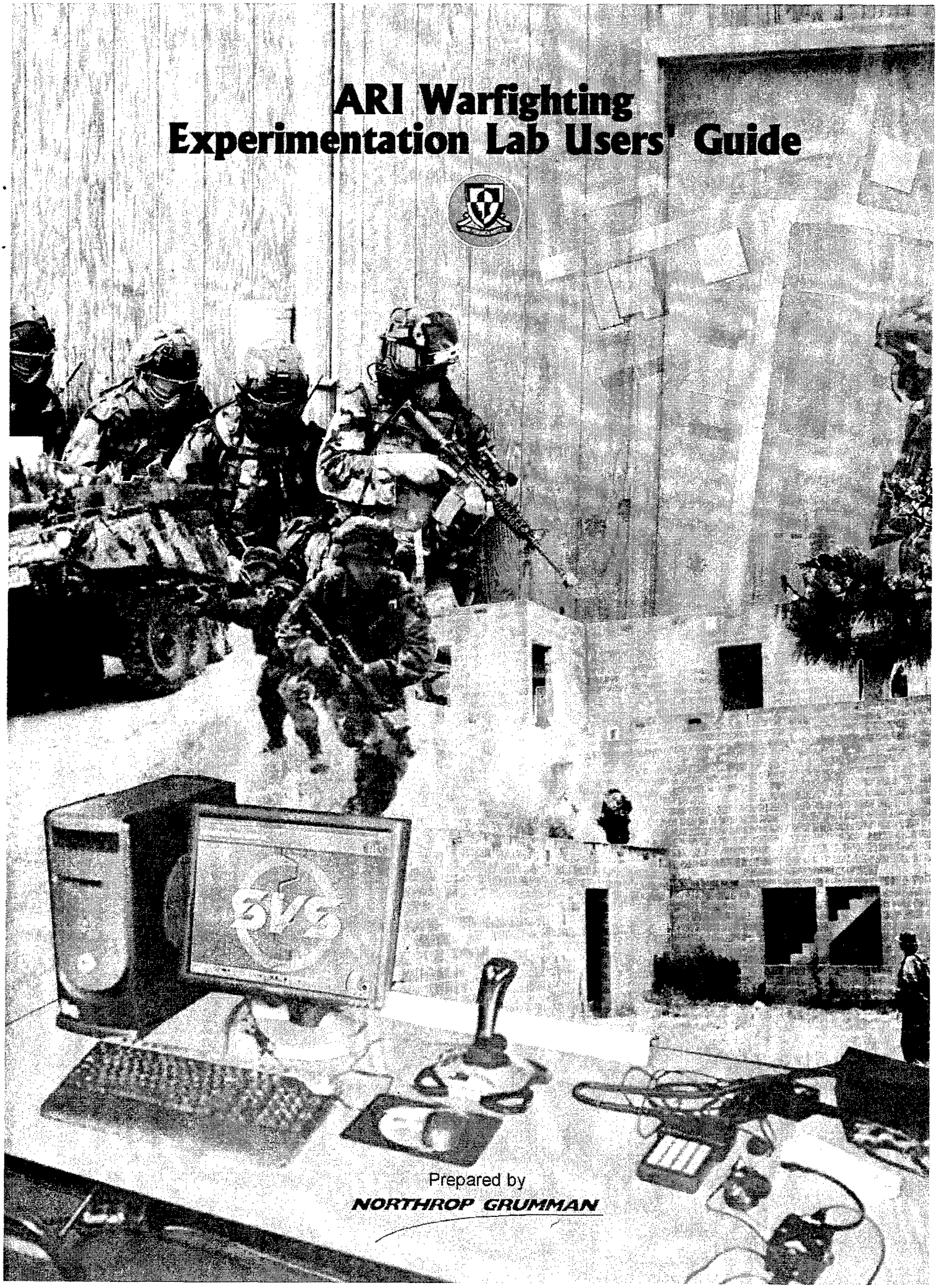
ARI Warfighting Experimentation Lab Users' Guide



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ARI WARFIGHTING EXPERIMENTATION LAB USERS' GUIDE

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ARI Warfighting Experimentation Lab Users' Guide
Army Research Institute's Infantry Forces Research Unit

I. General

1. Purpose: The purpose of this guide is to provide pertinent information to research scientists, civilian and/or military subject matter experts serving as battle masters and scenario creators, and the OneSAF OTB operator concerning the Army Research Institute's (ARI) Infantry Forces Research Unit (IFRU) Warfighting Experimentation Lab located in the basement of Building 75, Fort Benning, Georgia.

2. Scope: This guide covers the duties and responsibilities of the various personnel required to run an experiment, planning requirements, basic instrument operations designed to supplement the available vendor user guides and instructions, operations, and data archive processes.

3. System Description: The ARI IFRU Warfighting Experimentation Lab consists of ten computers, a network hub, a simulated radio system, and an after action review/data retrieval system.

a. Soldier Stations. There are four Soldier stations that consist of Dell ®Dimension 8300™ computers with a 3 gigahertz (GHz) Pentium 4 processor, equipped with two partitioned drives with 112 gigabytes (GB) of storage space, 1GB of Random Access Memory (RAM), a combined digital video drive (DVD) and compact disc rewritable (CD-RW) drive, a SoundBlaster® compatible soundcard, two network interface cards (NIC), an 18 inch flat screen flat panel monitor, and a 128MB PCI Express™ x16 ATI Radeon™ X300 SE graphics card. Each station is also equipped with a headset and individual controller for the simulated radio system. Stations 6 and 8 are equipped with a remote interface unit (RIU) and Stations 2 and 8 have a hand-held terminal (HHT) for the simulated radio system. Each computer has standard software, Microsoft Office 2000 ®, and the Advanced Interactive Systems ® Soldier Visualization System™ (SVS) installed. The operating system (OS) is Windows XP Professional Edition®. Station 8 will always be the senior leader's station.

b. Control Stations. There are six control station computers. Four are identical to the Soldier workstations with the following exceptions:

1.) Station 1 is the Battle Master station and has the Battle Master SVS software installed which allows attachment of entities, and operation in the stealth mode. Station 1 also has an RIU, HHT, and headset.

2.) Station 2 is the OneSAF OTB station. It does not have SVS installed, but rather Version 1 of OneSAF OTB. Instead of Windows XP Professional® as an OS, Station 2 uses Linux Red Hat Version 9.0 ™ as the OS. Station 2 also has a radio simulation system consisting of the headset and HHT.

3.) Station 3 is the audio logger computer and stores all the simulated radio system traffic. It is a Dell 8300 identical to the Battle Master station, except it does not have SVS installed, however it does receive data from the Digital Audio Control System (DACS) to record the audio transmissions and data.

4.) Station 4 is the logger station. It is identical to Station 1, except that it stores the data created by the Virtual Soldier Simulation Assessment (ViSSA) computer. It has no simulated radio system.

5.) Station 9. The computer at the center of the console underneath the network hub is the DACS. It is the primary integrator of communications traffic, and must be programmed with a communications model (done by the OneSAF OTB operator) for each scenario. The monitor and keyboard for the DACS are collocated with the DACS.

6.) Station 10. The computer at the far end of the control bank is used to set up or program to capture selected events. It has the ViSSA assessment tool installed.

c. Network Hub: The network hub on top of the DACS computer connects all the stations and computers together.

4. System Layout. The system layout for the Warfighting Experimentation Lab is shown in Figure 1.

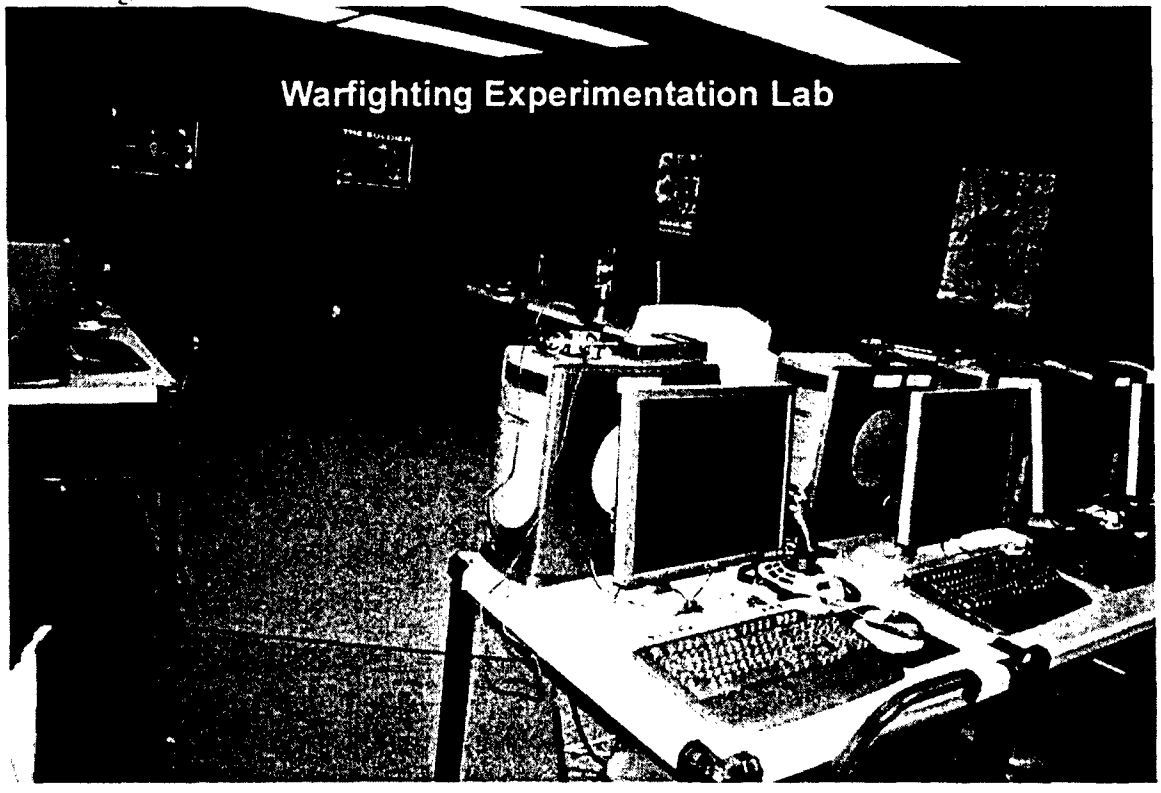


Figure 1. Warfighting Experimentation Lab

Individual stations are shown in Figure 2. The system layout for the control stations is shown in Figure 3

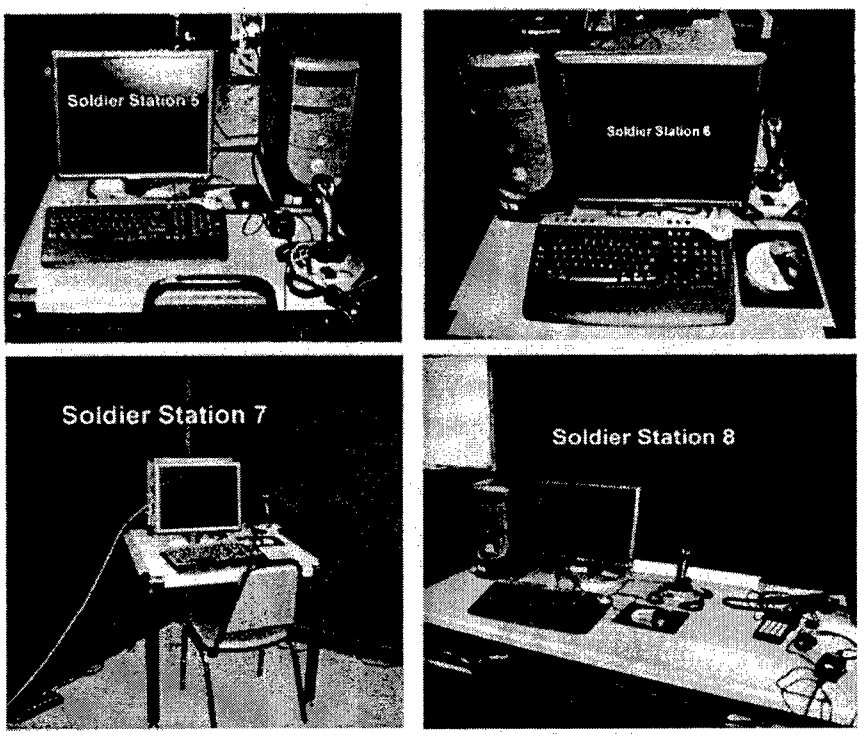


Figure 2. Individual stations

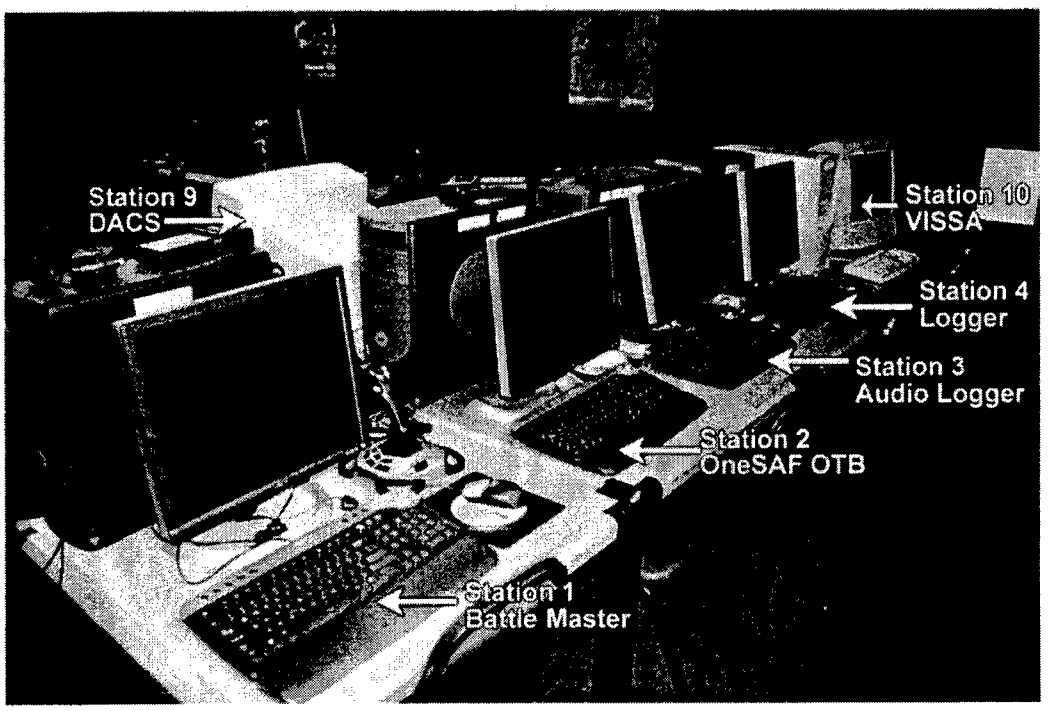


Figure 3. Control Stations

II. System Start Up

1. Sequence of Start Up: There are four computers within the system that require a specific start up sequence. The OneSAF OTB and DACS computers must be started first. Following that, the ViSSA assessment computer must be started followed by the ViSSA Logger and ViSSA Audio Logger computers. After that the system can be started in any sequence.

2. OneSAF OTB Terrain Database

   a. Terrain Databases Available. There are currently three selections – McKenna, which is the McKenna MOUT Site at Fort Benning, NTC, which is the National Training Center at Fort Irwin, and Fort Polk, which is the Joint Readiness Training Center (JRTC). The OTB operator will select the appropriate terrain database.

   b. Preset Scenarios. There are approximately 6 preset scenarios based on the scenario generation tool (Wampler, Blankenbeckler, Dlubac, 2004) that are in the system. Any modifications to the scenarios would require pre-planning and detailed instructions to the OneSAF OTB operator concerning OPFOR and BLUFOR activities and actions. Should the battle master want to change the events list, changes will also have to be made to ViSSA and to the DACS computer model for the exercise.

   c. New Scenarios. Developing new scenarios is a detailed, time consuming, and difficult task. At least ten working days are required to develop and test new scenarios PRIOR to the experiment. See Experiments, Personnel Requirements and Roles.

   d. Requirements
      1.) Entities. There are a variety of entities available. The battle master or research scientist need to make the OneSAF OTB operator aware of which entities they will need for their experiment at least ten working days prior to the experiment so that they can be obtained from the Army Model Exchange (if not available in the OneSAF OTB or SVS library) and programmed. See TAB A, Entity Requirements.
      2.) Phases. The actions of entities are controlled via phases of an operation. Information that the OneSAF OTB operator needs in advance are the experiment start locations, orientation (direction in which they are facing), engagement areas, objectives, and phases of the operation. The OneSAF OTB operator needs to know if the phases are event driven or time line driven, so that the appropriate programming can be performed. It is highly recommended that the research scientist and/or battle master review the locations, equipment types, and phases prior to the experiment so that any corrections can be made, if necessary. This should take place the working day prior to the experiment.
      3.) Timelines/Actions. The master event list created by the battle master will normally drive the phases for the OneSAF OTB operator. The

battle master MUST be sure that the master events list and the phases and actions that need be taken by BLUFOR not directly controlled by the subjects and the OPFOR are coordinated. If they are not, lengthy delays in the experiment may be affected.

3. Soldier Visualization System (SVS)
   a. Soldier Station
      1.) Start Up. The SVS is started by selecting the SVS Launch icon in the lower left of each of the Soldier stations. Soldiers who are subjects should not be allowed to start the system, since it is possible to accidentally zero out some of the options that the battle master has selected for each station. See Figure 4.

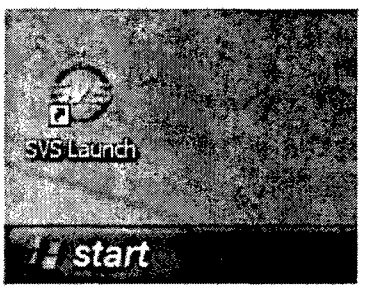


Figure 4. SVS Subject Station Start Up Icon

      2.) Control Panel. When the start up icon for SVS has been selected, the SVS will begin initialization, showing the screen in Figure 5. SVS Initialization.

Figure 5. SVS Initialization Screen

open to a control panel, shown in Figure 6. Either the battle master or the OneSAF OTB operator can enter the appropriate data, which is

covered in this guide.

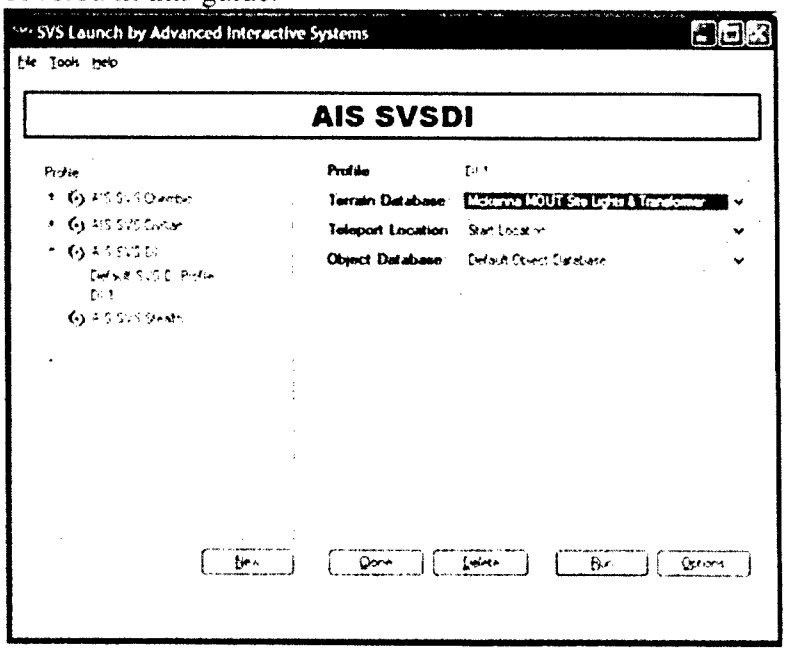


Figure 6. SVS Control Panel

3.) Configuration. In order to accomplish certain critical settings, such as weather, time of day, weapons, ammunition, the battle master or OneSAF OTB Operator must select the options button. The varieties of options available for the experiment are discussed in TAB B, Configuring the SVS Soldier Station.

4.) Joystick. Joystick commands and button usage are discussed in detail in TAB C, Joystick Operation SVS Soldiers. This TAB is also provided as a job aid for each station so that Soldiers can familiarize themselves with the stick operation. Time should be allocated during the first hour of an experiment to allow Soldiers to 'play' with the simulation and joystick to become familiar with its operation.

b. Stealth Battle Master Control Station

1.) Start Up. When the Battle Master Station starts, it is already in the stealth mode. Start up is the same for the Soldier Stations.

2.) Joystick. The Joystick for the Battle Master Station works differently than does the one for the Soldier Station. TAB D provides detailed instructions on its operation, and a job aid is included with the packet as a quick reference guide.

3.) Stealth Modes. The stealth modes allow the battle master to move around the simulation environment without being seen. There are a variety of modes available. See TAB E, Stealth Modes, for the various modes and what advantage they provide the battle master.

4.) Artillery Tool. The artillery tool is designed to allow the battle master to place artillery or air strikes on the synthetic battlefield for either the BLUFOR or OPFOR. The use of the artillery tool is covered in detail in TAB F – Artillery Tool.

4. Advanced Simulations Technology, Incorporated ™ (ASTi) Simulated Radio System

a. Configuration. The battle master or research scientist must coordinate with the OneSAF OTB operator to set up the radio model ten working days in advance of the experiment. The radio system is capable of running two radio nets, one between the prime subject and the battle master (considered to be similar to the company or platoon command net) and between the prime subject and the other subjects of the experiment (considered to be the platoon or squad command net). Communications degradation can be programmed into the model, as can jamming. It is necessary to inform the OneSAF OTB operator of these requirements so that the radio model can be properly programmed. If it is not, these features will not be available at the time of the experiment. The battle master must also assign call signs for all players and himself for the experiment prior to the experiment. These callsigns can be made available to the subjects and the research scientist on a simple callsign sheet or CEOI extract.

b. Startup. The OneSAF OTB operator will set the system up and have it operating and tested prior to the experiment. The operator will most likely require the assistance of the battle master. This can be done the day prior to the experiment.

c. Channels. The current system can support two channels of simulated radio traffic and an intercom system, if required.

d. Audio Logger. The OneSAF OTB operator will operate the audio logger computer, which is actually a part of the ViSSA system. While the data written to the audio logger can be backed up to a CD or DVD, the data cannot be played back on any other machine than the audio logger computer in the lab. The research scientist should schedule time in the lab with the OTB operator to listen to the audio log after the experiment is completed.

e. Components.

1.) Remote Interface Unit. Each Soldier station will have a headset and individual control set that controls the intercom, radio transmission and monitoring, and volume. See Figure 7.

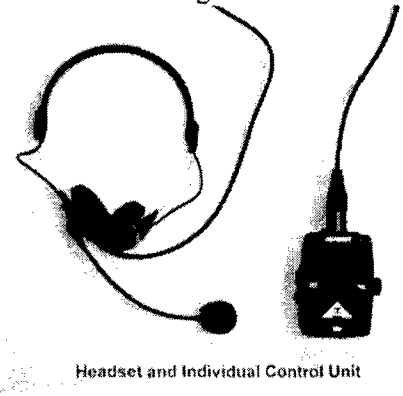


Figure 7. Headset and Individual Control Unit.

2.) Every other station will have a remote interface unit (RIU) that connects to their computer and to the DACS. See Figure 8 for views of the RIU.

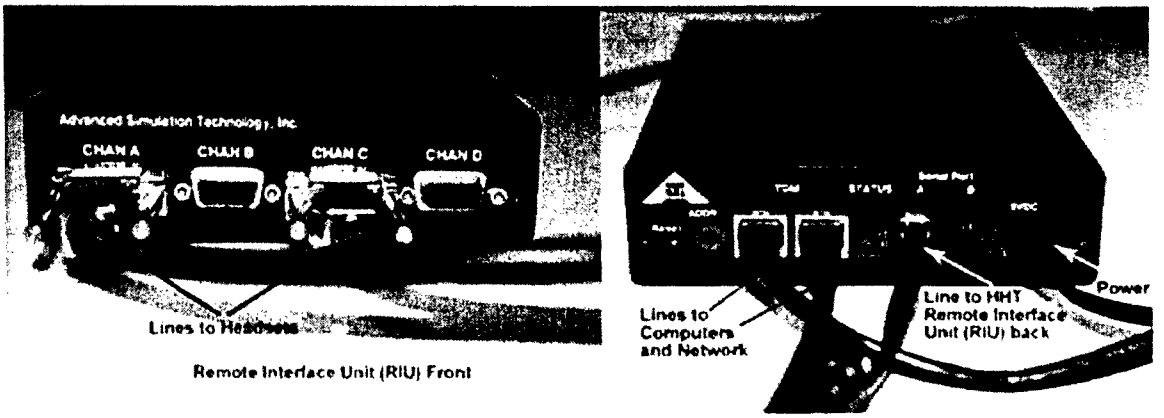


Figure 8. Views of RIU.

3.) Station 8, occupied by the senior Soldier leader will have a hand held terminal (HHT) available as well. The OneSAF operator prior to the experiment will instruct Soldiers on their use and a communications check will be conducted. See Figure 9 for a view of the HHT.

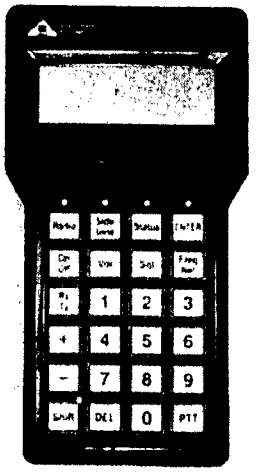


Figure 9. Hand Held Terminal (HHT)

4.) The entire communications system is controlled by the DACS. The DACS controls all audio and simulated radio traffic. This is the unit that must be programmed with a communications model prior to an experiment. See Figure 10.

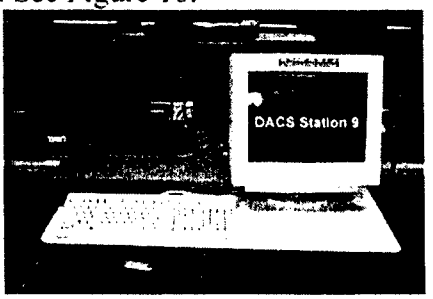


Figure 10. DACS Views.

5. ViSSA After Action Report System

a. Configuration. The ViSSA system is made up of three computers: the ViSSA assessment computer, which is used to establish automated points of assessment; the ViSSA logger, which records data both in an automated fashion from the ViSSA assessment computer and manually input data during the course of an experiment; and the ViSSA audio logger, which records all audio and simulated radio traffic and indicates who is transmitting and who is receiving the call.

b. Startup. The ViSSA assessment computer must be started after the OTB and DACS computer, and then the ViSSA assessment, logger, and audio logger computers started. After that, the remaining computers may be started in any order.

c. Feedback/Replay. While the experiment is running, the OTB operator or the research scientist may manually input critical points and notes concerning the data that is input. The screen for this is on the logger computer and is shown in Figure 11.

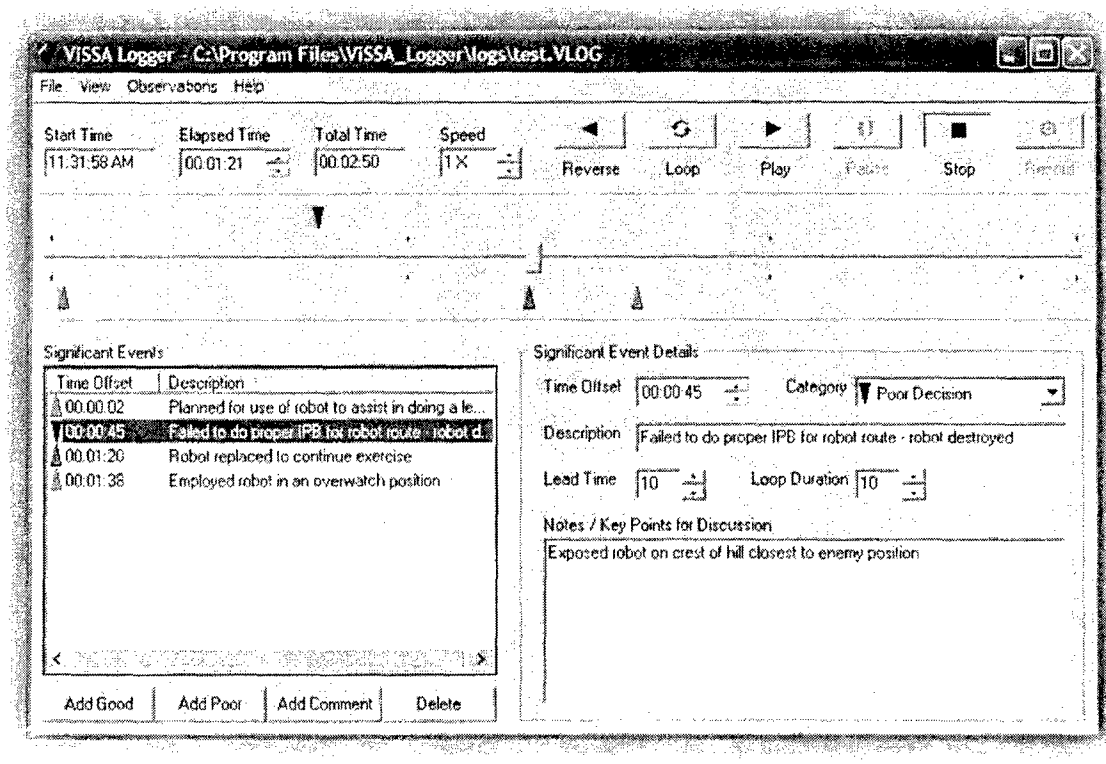


Figure 11. Logger Manual Input Dialog Screen.

d. Input to obtain automated data must be precise. The research scientist may want to know things like, what time did the 3d Platoon cross the Line of Departure / Line of Contact (LD/LC), what time did the 3d Platoon make contact with the lead enemy forces, or what time did the 3d Platoon arrive on the objective. Data items such as when did the 3d Platoon secure the objective are subjective opinions, and must be manually inputted.

e. Record of other automated data listed as events are shown in Figure 12. Data such as when SVS Soldiers were wounded or killed, when artillery was fired, who fired and who was killed, etc are recorded.

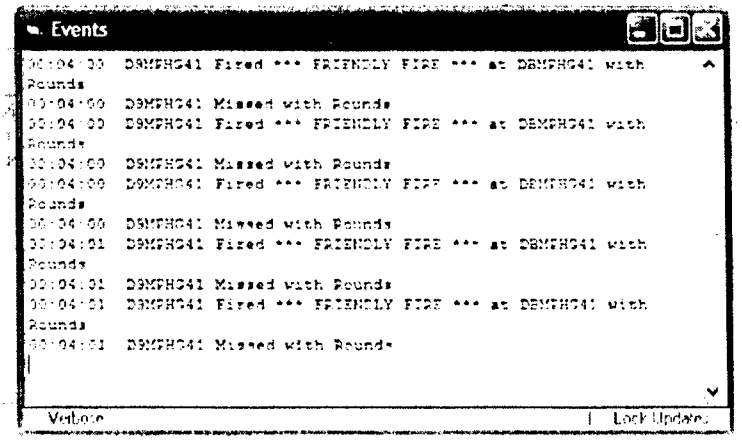


Figure 12. Events Report

f. Mission status will show the research scientist who fired, how effective their fire was, who was killed or wounded and whether or not they were regenerated, as indicated by the R. The Mission Status Report is shown in Figure 13. This same data is also available for OPFOR entities and neutral entities.

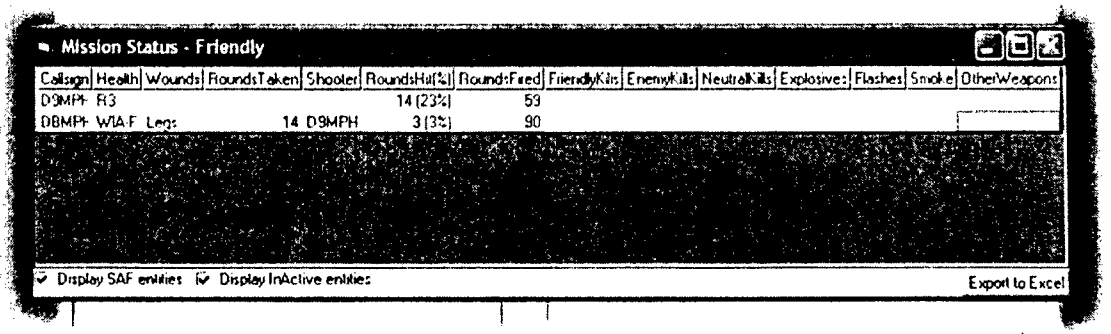


Figure 13. Mission Status Report.

g. Storage of data. The data for these reports can be exported to Microsoft ® Access™ or Microsoft ® Excel™, however, a report format will need to be created in the future in order to be able to read the tables that it creates. Data is not formatted into a report, and therefore is difficult to read and translate. Until a report or query is created, the research scientist should review the data on the logger computer.

III. Experiments

1. Scenarios. Scenarios can be developed by either using the Scenario Generation Package (Wampler, et al. 2004), or they can be developed individually and

uniquely, based on the needs of the research scientist and experimenter. Both the battle master and the research scientist must bear in mind that the only complete terrain databases that work in both SVS and OneSAF OTB are the McKenna MOUT site and the NTC. Terrain is limited in both, and where forces must be located off the initial screen, some creative positioning must be used. OneSAF and SVS, when working together, cannot bring forces into the simulation environment from locations that are off the "board".

2. Planning. Please use the Suspense Matrix when planning for any experiment. The matrix shows what actions are necessary prior to the experiment and when the various support personnel must have them to allow them to do their jobs and prepare for the experiment. This primarily affects the research scientist, battle master, and OneSAF OTB operator.

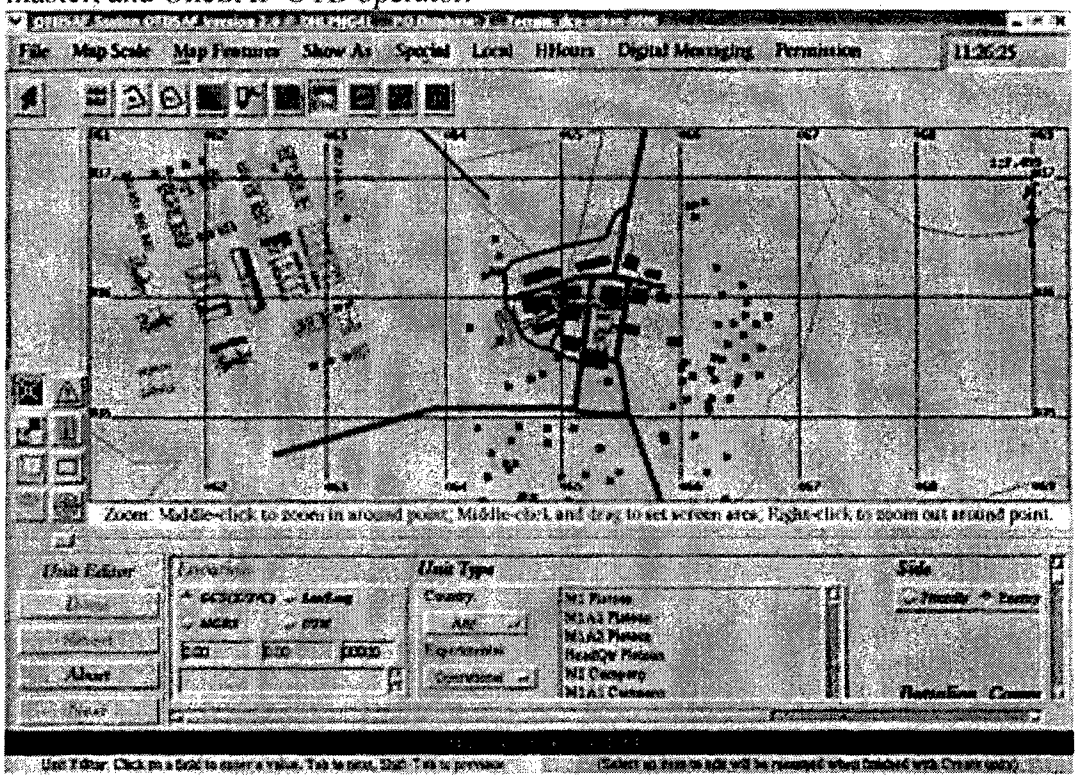


Figure 14. OneSAF OTB Screen - McKenna MOUT Site.

3. Personnel Support Requirements and Roles. There are three key personnel involved in the operation of the ARI Warfighting Experimentation Lab. They are:
   a. OneSAF OTB Operator. The OneSAF OTB operator is actually a partial title. This person is responsible for the programming of the scenario in OneSAF. This includes BLUFOR and OPFOR units, equipment, personnel, actions by each, and phasing of each operation. Once the exercise is underway, this person initiates each phase, or takes direction from the battle master as to which activity should occur next. The OneSAF OTB operator must also make sure that the scenario and the battle master's master event list are synchronized to avoid any delays during the experiment. The OneSAF OTB operator should have the scenario programmed and ready to be reviewed by

the battle master three working days prior to the actual experiment. The OneSAF OTB operator must also program the ASTi radio simulation system for the model required by the battle master. The program should include up to two radio nets, and what and when any degradation or jamming should occur during the experiment. The OneSAF OTB operator must also program the ViSSA after action review program to capture key events during the experiment. Guidance for this should come from both the battle master and research scientist. The operator must also program each SVS Soldier station for weapons and organization, and if any OneSAF models are to be linked to the SVS Soldiers. Finally, the operator must be present during the experiment to run OneSAF, ViSSA, the ASTi simulated radio system (to include showing Soldiers how to operate the radios and the SVS program and joystick), and retrieve after action review files, and archive them immediately upon completion of the experiment. The operator must make CD-ROM(s) for the research scientist as data from the VISSA logger and the audio logger.

b. Battle Master. It is the responsibility of the battle master to create the scenario that supports the research scientist's goals in an experiment and to check scenario programming done by the OneSAF OTB operator. These scenarios and the master events list must be in the hands of the operator NO LATER THAN five working days prior to the experiment (40 hours). The battle master is also required to operate the stealth/battle master station during experiments, and to operate the experiment's tactical command net, and monitor the subject command net. The battle master must review the programmed scenario in the OneSAF OTB and perform a radio check among all radios prior to the experiment. The battle master gives direction to the OneSAF OTB operator and takes direction from the research scientist. The battle master provides military expertise in tactics, doctrine, and military organization and equipment.

c. Research Scientist. The research scientist must develop a research or experiment execution plan at least fifteen working days prior to the exercise and coordinate with the battle master so that a clear purpose of the experiment is made, and that the battle master is aware of critical data that must be captured during the experiment. The research scientist does not necessarily need to be present for the experiment, however; it is recommended. Once the experiment is concluded, the battle master and OneSAF operator will backup all captured data on CD-ROMs for the archives, however; they will not clear such data until approved by the research scientist. It may be possible to conduct an after action review using captured data with the Soldiers who took part in the experiment as a learning event for them.

d. Depending on the intensity of the experiment, and the amount of involvement the OTB operator will have with moving OPFOR forces and secondary BLUFOR forces, a fourth person can be added to operate the logger computer. This person would be responsible for the input of manual data and comments as directed by either the research scientist or battle master. This person should be a skilled typist.

4. Execution of an experiment. See TAB G, Suspense Matrix.

5. Data collection. The audio logger and the ViSSA computer will primarily collect the raw data. That data will be backed up on a CD-ROM by the OneSAF operator and maintained in the lab's files.

6. Data archiving and storage. All audio logger and logger data will be backed up to a CD or DVD ROM and maintained in the lab's files until released for destruction by a research scientist from ARI.

IV. Backing Up and Resetting the System After an Experiment

1. SVS. The SVS Soldier Station computers save no data. There is no requirement to back up or reset anything on these computers.

2. ASTi Simulated Radio System. Communications models may be kept on the DACS computer. There is no requirement to back up any data on this computer for an exercise.

3. OneSAF OTB. The OneSAF OTB computer should have scenario files saved. A descriptive phrase or explanation and the file name should be kept in a log, in the event that future experiments might need them. If these files become too big, they should be backed up on a CD-ROM and the files cleared from the computer.

4. ViSSA. There are three ViSSA computers, two of which must have data saved and backed up. The ViSSA assessment computer does not save any data that is of any use to the research project and requires no downloads for the research scientist.

TABS

A – Entity Requirements
B - Configuring the SVS Soldier Station
C - Joystick Operation SVS Soldier
D - Joystick Operation SVS Battle Master
E - Stealth Modes
F – Artillery Tool
G – Suspense Matrix
H – Acronyms
I– Sample Experiment Plan
J – Available Scenarios using the Scenario Generation Package
K - References

TAB A – Entity Requirements

1. Purpose: This TAB defines the information requirements for entity requirements for an experiment. The SME should make himself knowledgeable of what BLUFOR and OPFOR entities already exist within the OTB and SVS environment. Also, the Warfighting Experimentation Lab has an account with the Army Model Exchange, and those entities (models) are listed in paragraph 2 below.
2. Army Model Exchange. The following vehicles are present in the OTB and SVS from the Army Model Exchange Program. Some can be substituted as indicated.

Table 1. Model Listing

Model	**Substitute for**
2B14 PODNOS 82mm Mortar	82mm mortar
2S11 120mm Mortar	120mm mortar
2S12 120mm Mortar	120mm mortar
6M Recon (USMC)	ARV-A or Class I Robot
BTRT	ARV-A or Class I Robot
40' Container	CUDO Laser Alignment Device
Toyota with 50 cal	For technical vehicles
Toyota with Recoilless Rifle	For technical vehicles
Jeep Wrangler, green or tan	For GAZ69
M1126 Stryker ICV	
M1127 Stryker Recon Vehicle	
M1128 Stryker MGS	
RQ1 Predator	Class I UAV
Hunter	Class I UAV
Pioneer	Class II UAV
Toyota	Pickup truck
M113	Class I Robot

3. If the BLUFOR or OPFOR entity is not listed above or in the models in OTB or SVS, the SME can request a model from the OTB operator. The OTB operator will need at least 10 working days notification so that the model desired can be downloaded and an enumeration table created for it. The SME must provide a description of the vehicle, preferably with a photograph or drawing of the vehicle. The SME must also provide the capabilities of the vehicle, which are listed in paragraph 4 of this TAB. If the entity is not available, then the SME must select one from the list of available entities as a substitute.

4. Entity capabilities. The following entity capabilities must be provided to the OTB operator to allow for the accurate programming of the enumeration table for that vehicle.
   a. Driving range on a full tank of fuel. Estimations are acceptable.
   b. Armament listed by primary and secondary weapons, and the maximum effective range and minimum range (if any).
   c. Speed of the vehicle on roads and cross-country.
   d. Where the critical kill points on the vehicle are located, and what caliber weapon will cause damage and what caliber weapon will cause a catastrophic kill.
   e. If entity capabilities are not known or the enumeration table modified, the substitute vehicle will take on the characteristics of the vehicle it has replaced. In other words, if the robot replaces an M113 armored personnel carrier, the robot will display the characteristics of an M113. This is especially important concerning kill capability (the robot will have the characteristics of an armored vehicle) and mobility.

5. If the precise vehicle or entity is not available within the Army Model Exchange, OTB, or SVS model listing, the SME will have to select a substitute vehicle or other type entity from what is available. If the SME is able to obtain a model from other sources that he desires to use, it MUST be in the OpenFlight format (.flt). It should also have models for that entity that show good condition, damaged condition, and destroyed condition. Textures must also be available, generally meaning green or woodland texture or tan or desert texture.

6. Never exceed 300 entities for any exercise or experiment. More than 300 entities will bog down the workstation's memory and redrawing and drawing of entities will be slow or partial. Also, the OTB is not capable of saving more than 300 entities, causing it to save only the most recent additions and dropping however many it takes to get to 300 maximum entities.

TAB B – Configuring the SVS Soldier Station

1. Purpose. To provide guidance on which elements of the SVS Soldier Station must be changed or developed prior to an experiment. The SME will have to set the configuration for each station prior to the arrival of the subject Soldiers. The configuration determines the following:
   a. Weapon types and equipment
   b. Ammunition, such as amount, tracer usage, and number of rounds.
   c. Additional ammunition such as signal flares, flash bang grenades, and fragmentary grenades.
   d. The environment, to include weather (wind direction, fog, rain, snow, and temperature) and time. If using the Scenario Generation Package (Wampler, et al. 2004), they should coincide to the light and weather data within that package.

2. To enter the profile options the SVS program must be started. This is done by clicking on the icon on the desktop as shown in Figure 15.

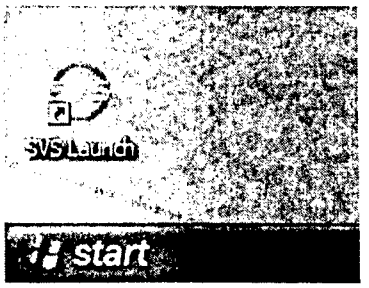


Figure 15. Launch window for SVS and configuration.

3. Select the profile that will be used during the experiment. Once it has been selected, click on the options button in the lower right corner of the dialog box. See Figure 16.

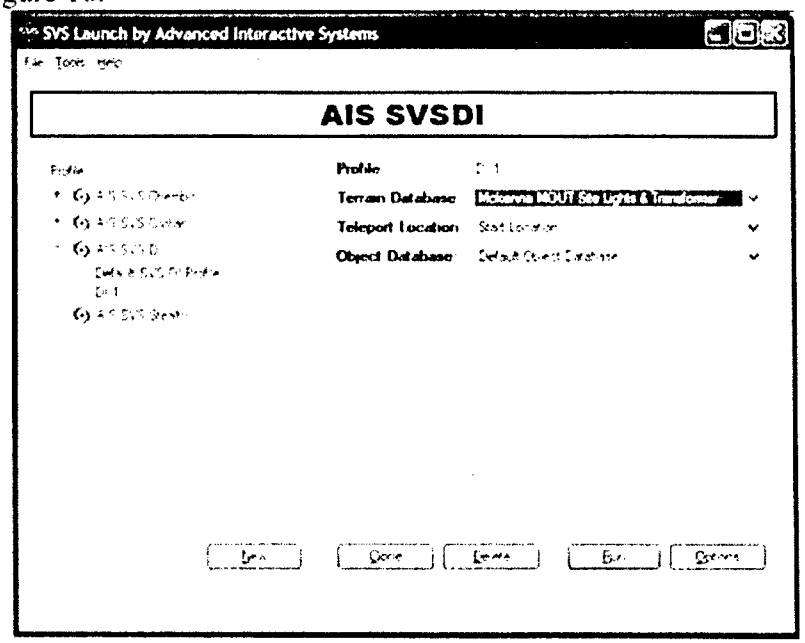


Figure 16. Profile options.

4. Selecting options will open the dialog shown in Figure 17. Leave all the settings in the default mode as they are shown in the figure. The Marking should be changed to match the SVS's callsign.

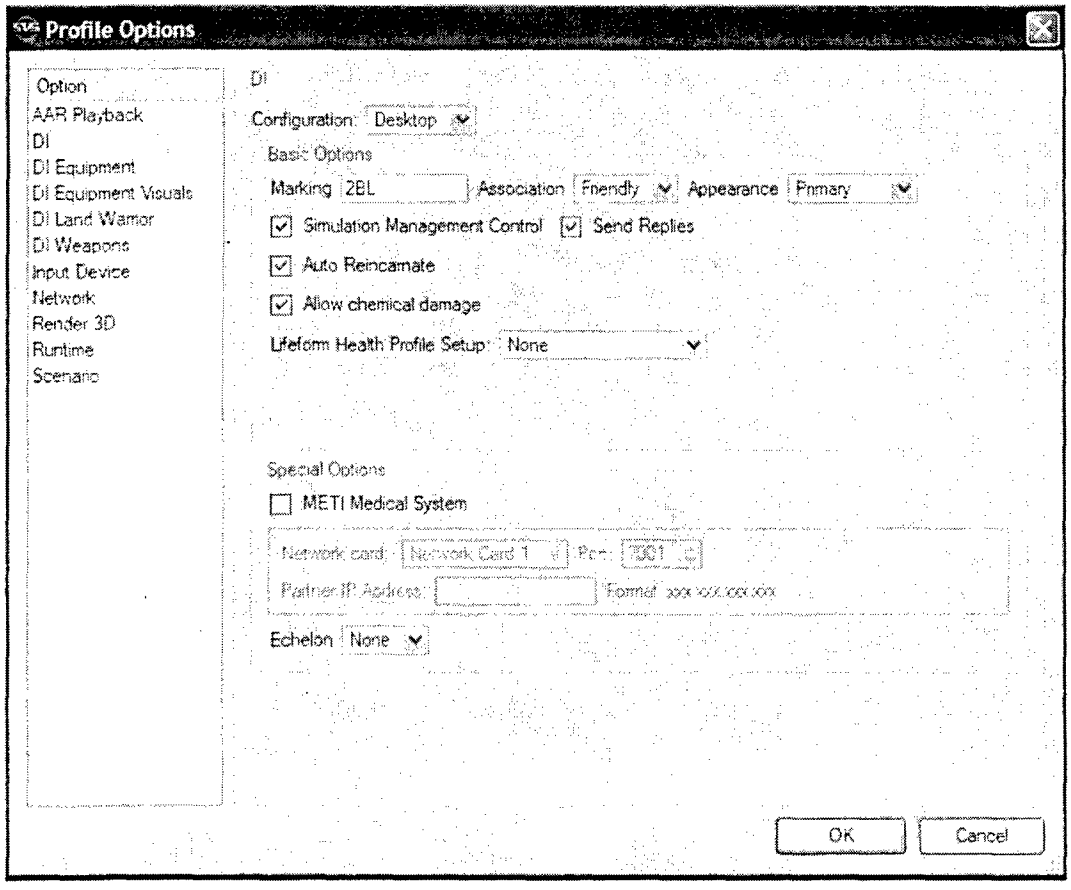


Figure 17. Profile Options SVS Soldier Station.

5. Select DI Equipment from the menu on the left. See Figure 18.

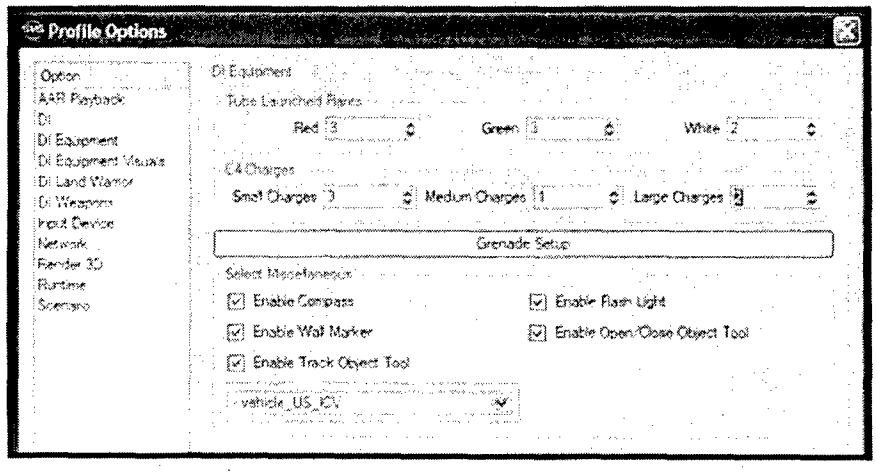


Figure 18. Selection Menu for Profile Options.

6. Enable those items that the Soldier SVS station will need during the course of the experiment's exercise. For example if the order specifies parachute flares, you would set up the basic load of flares by increasing the amount under Tube Launched Flares. Zero is the default for all three.
7. In the same dialog box, enter the number of explosive charges the Soldier station may need to breach doors and walls.
8. Select the grenade bar. It will open another dialog box that shows the types of grenades the Soldier station may have loaded. See Figure 19.

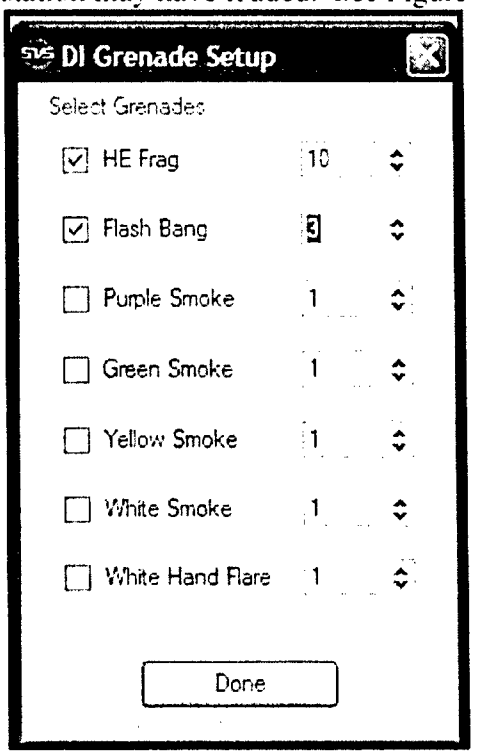


Figure 19. Grenade Menu.

9. In the Grenade Menu, check mark those grenades that the Soldier station will require during the experiment's exercise. Then assign the number of each he will need. Do not use the white parachute flare, since this is the same white parachute flare noted before, and will only add to the number of white flares the Soldier station has, and will increase the number of options they must cycle through when selecting a weapon. When completed, close this dialog window.
10. In the same DI Equipment dialog box, under Miscellaneous, select the equipment the Soldier station should have and the effects desired. It is best to select all boxes in the miscellaneous category. Then select the OK button.
11. Next select DI Weapons in the menu on the left. Figure 20 shows the weapons that the SVS Soldier can be equipped with during the experiment. The default is no weapon, so it is important that a weapon be selected. More than one weapon can be selected. For example, a Javelin gunner (AT8) can be armed with the Javelin and either an M9 pistol or an M4 carbine. The figure shows all checked, and this is not a good idea. Select a primary weapon based on the table of

organization and equipment, and if the Soldier station is armed with a crew served weapon, a personal weapon such as the M9.

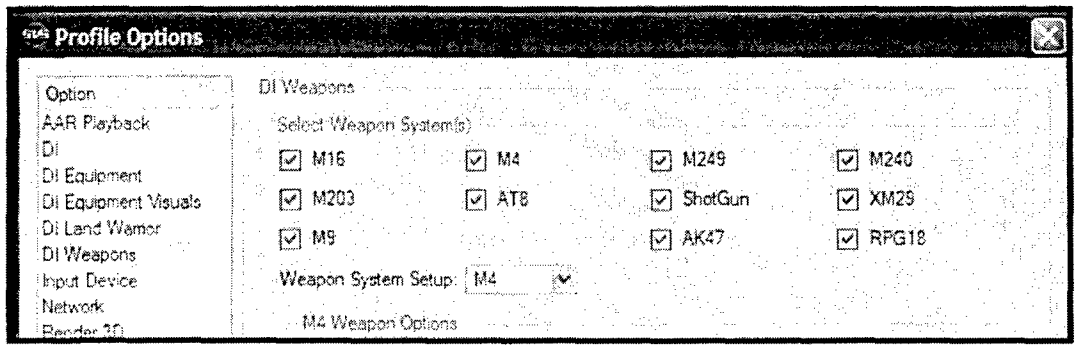


Figure 20. Weapons selection menu.

12. Be sure that the characteristics for that Soldier's weapon are set. They default to what is normal for a combat load for light intensity, however, if the Soldier is to have tracers or more or less ammunition, these would need to be set. To set weapons characteristics, click on the Weapon Setup bar under the weapons listings. See Figure 21.

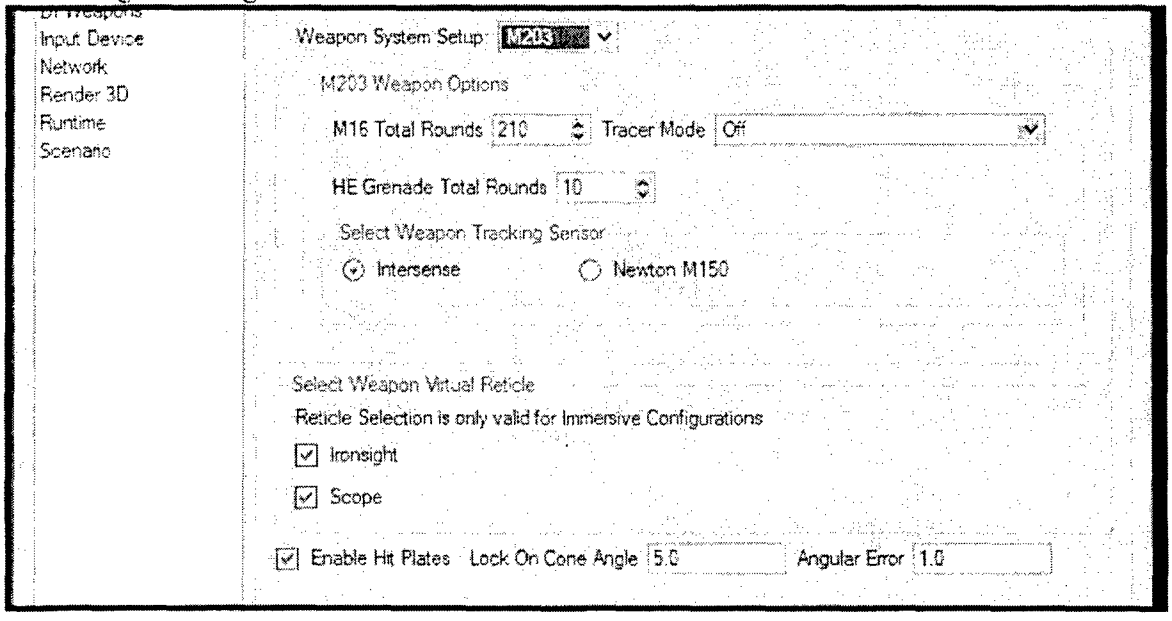


Figure 21. Weapons Characteristics Menu.

13. If the weapon M4 were selected, the dialog box shown in Figure 22 would appear. The ammunition amount can be selected. This is the total amount of the ammunition for that weapon which that Soldier will be allocated for the exercise. Each Soldier station can be resupplied with ammunition during the course of the experiment.

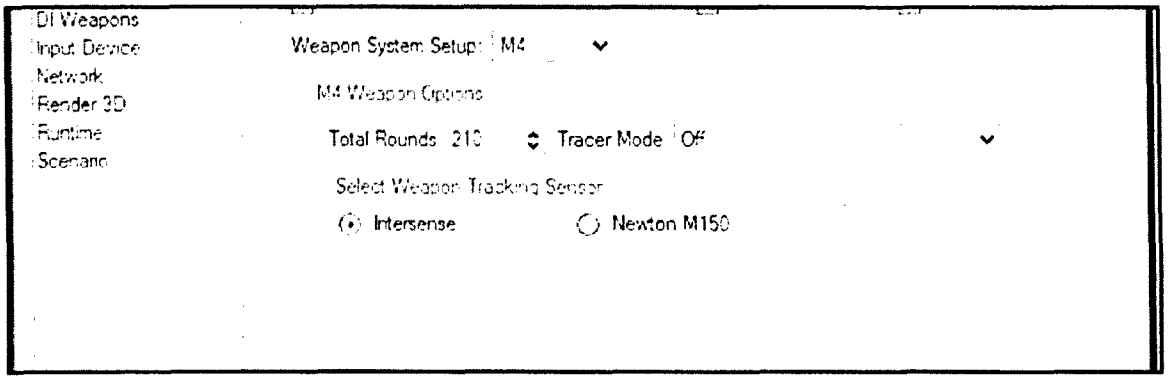


Figure 22. M4 Weapons Characteristics Dialog.

14. Only those weapons that normally fire tracers will have a tracer mode menu. Click on the down arrow and the menu shown in Figure 23 opens. Make a selection based on the experiment and what needs set for this particular Soldier.

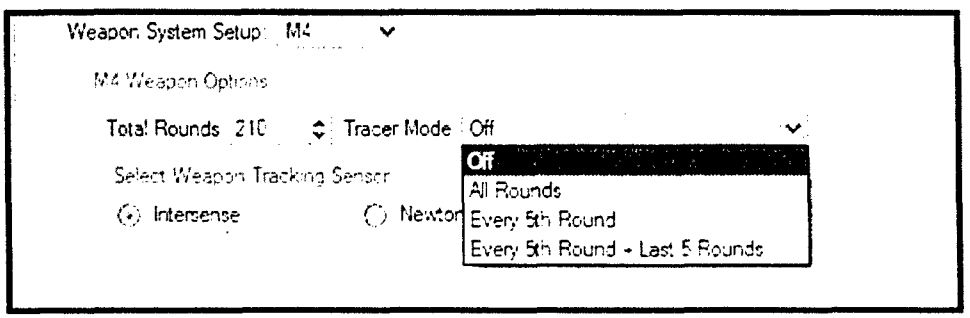


Figure 23. Tracer Mode Menu.

15. The Soldier may also be tasked to carry signal flares. There are three options or combinations, which are green, red, and white parachute flares. Select the total number for that Soldier of each type he needs. See Figure 24.

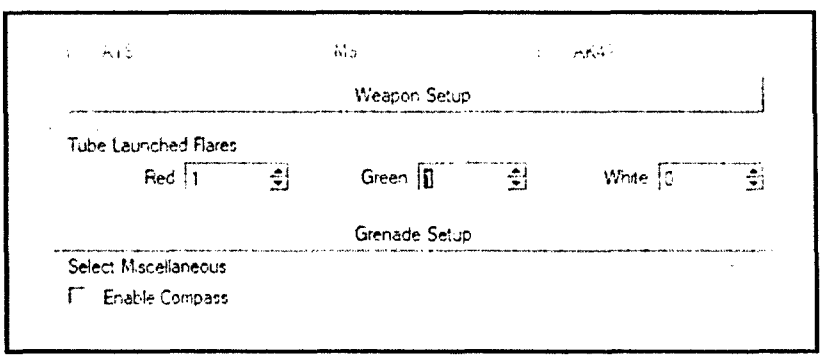


Figure 24. Parachute Flares.

16. You can also arm each Soldier with a variety of grenades. Notice the Grenade Setup bar below the Tube Launched Flares inputs in Figure 24, above. Select that bar and it will open the menu shown in Figure 25. Then determine which

grenades (by checking the box to the left of the name) that Soldier will have, and how many. The White Hand Flare is the same as the parachute flare from the flares screen.

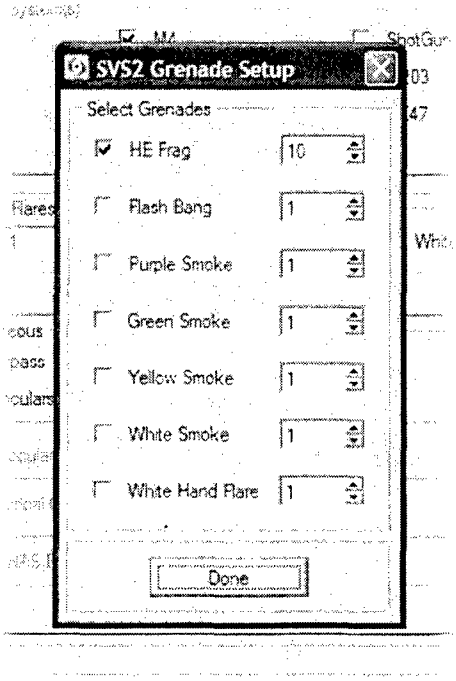


Figure 25. Grenade Menu.

17. The last equipment menu selections that may need to be made are miscellaneous selections. The compass selection can be useful. It appears at the bottom of the screen and is brought up on command by the Soldier. It shows in degrees which direction the Soldier is facing.

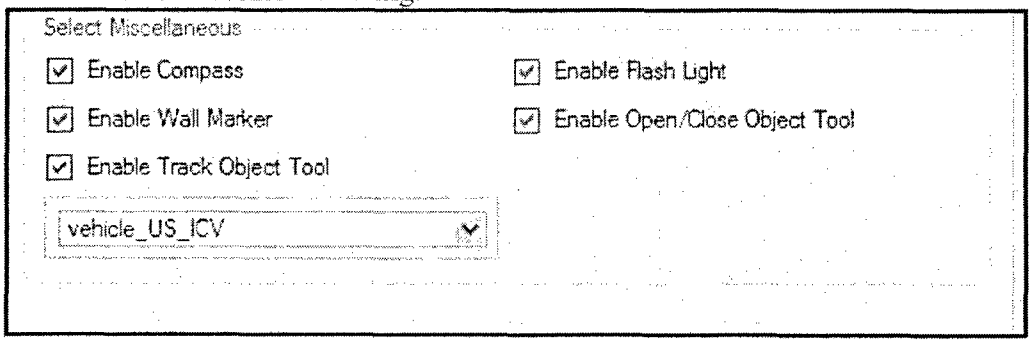


Figure 26. Compass and Binocular menu selections.

18. Configuration is completed for the Soldier SVS Station. This must be repeated for each Soldier Station.

19. Land Warrior functions must be used carefully since the Soldier will have to cycle through whichever capabilities have been pre-selected in options when they are

trying to select a weapon or feature. The menu offers the selections as shown in Figure 27. The key feature is the laser range finder, which will tell the Soldier how far they are from the point at which they aim. This feature stays on until it is selected again. The other features are only useful if remotely connected to a real system. The Land Warrior menu will allow connection to a real Land Warrior Version 0.6 system, or to a command, control, communications, computer, and intelligence (C4I) system such as the Force XXI Battle Command and Control for Brigade and Below (FBCB2) system. In order to do this, select the Send to Remote C4I/SA System. To select FBCB2 use the UDLP ICV system. For newer versions of Land Warrior select LWTB C4I System.

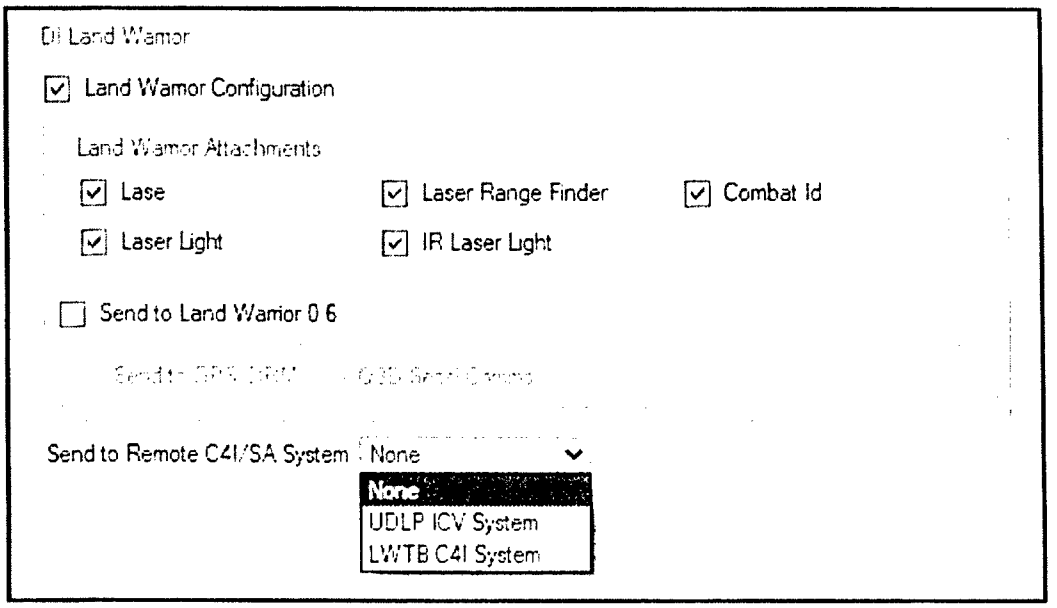
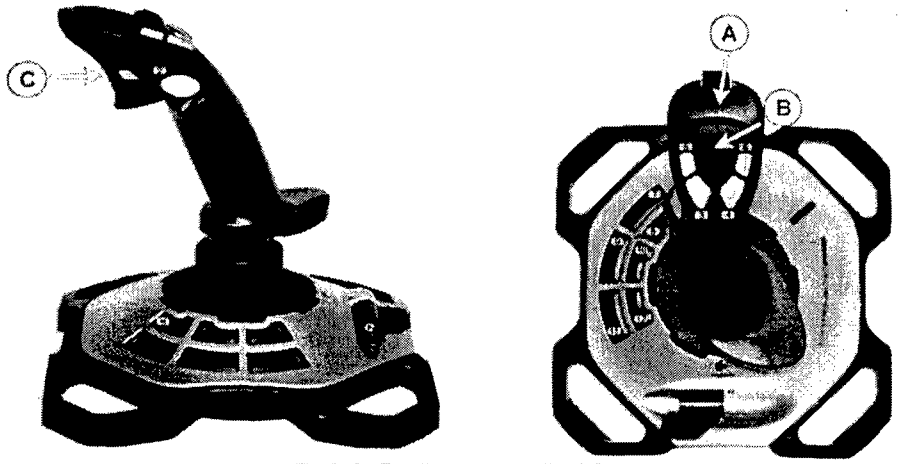


Figure 27. Land Warrior Menu.

TAB C Joystick Operations for the SVS Soldier Station



Quick Reference Guide
Joystick for SVS Soldier Station

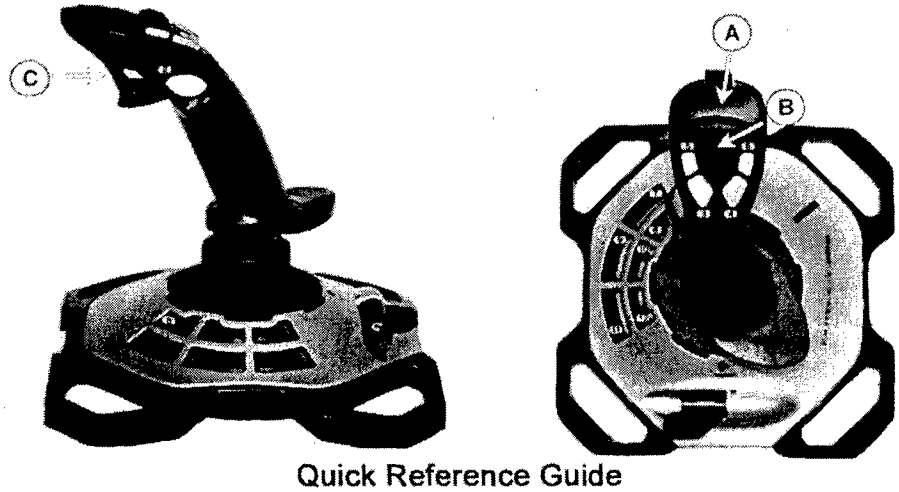
Desired Action	Button	Comments
Select Weapon	4	Cycle thru options to Select Weapon
Cycle thru Available Weapons	5	
Reload Weapon	4,6,4	
Select Fire Mode	7	Cycle thru Safe, Semi, Auto as available
Prone	3	Cycle thru to desired setting
Kneel	3	Cycle thru to desired setting
Stand	2	Cycle thru to desired setting
Unstick Movement	4,5	Cycle thru to options to Unstick, press 5
Move Forward	A	Push forward
Move Backwards	A	Pull back
Side Step Left or Right	A	Push left or right
Turn Left or Right	A	Twist joystick left or right
Look Up	B	Push hat button forward
Look Down	B	Pull hat button backward
Center View	B	Push hat button left or right
Fire Weapon	C	Pull trigger

Desired Action	Button	Comments
Select Binoculars	4&5	Select Button 4 and cycle through until binoculars shows in the lower left corner of the screen. Press Button 5 to select Binoculars.
Zoom In with Binoculars	4&5	Select Button 4 and cycle through until the command Zoom shows in the lower left corner of the screen, then select the 5 button and continue to press it until the desired zoom is attained. In the binocular mode the settings for zoom are 2x,4x, 7x, 9x, and 11x
Select NVG or Thermal	4&5	Select Button 4 and cycle through to NVG/Thermal and use 5 to select NVG or Thermal
Zoom In with NVG or Thermal	4&5	Select Button 4 and cycle through until the command Zoom shows in the lower left corner of the screen, then select the 5 button and continue to press it until the desired zoom is attained. In the NVG/Thermal mode the settings for zoom are 2x,4x, and 7x
Shut off Binocular, NVG, or Thermal	4&5	Select Button 4 and cycle through until the desired optic is showing in the lower left corner of the screen and then select Button 5 to shut off the optic.

Quick Reference Guide for the Use of Binoculars, Night Vision, and Thermal Sights.

NOTE: You are unable to move while in the binocular, NVG, or thermal mode. It is recommended that you select the prone or kneeling position before selecting the optic of you choice.

TAB D Joystick Operations for the SVS Stealth Station



Quick Reference Guide
Joystick for SVS Stealth Station

Desired Action	Button	Comments
Move Forward	A	Push forward
Move Backwards	A	Pull back
Side Step Left or Right	A	Push left or right
Turn Left or Right	A	Twist joystick left or right
Look Up	B	Push hat button forward
Look Down	B	Push hat button back
Center View	B	Push left or right
Gain Altitude	2	Hold button down until at desired altitude
Loose Altitude	3	Hold button down until at desired altitude
Select Stealth Mode	5	Cycle thru to desired mode. See Appendix G, Stealth Modes.
Select Free Fly Mode	4	Cycle thru to desired mode. See Appendix G, Stealth Modes.
Start Scenario	4	Cycle thru to desired mode. See Appendix G, Stealth Modes.
Stop Scenario	4	Cycle thru to desired mode. See Appendix G, Stealth Modes.
Reset Scenario	4	Cycle thru to desired mode. See Appendix G, Stealth Modes.
Pause Scenario	4	Cycle thru to desired mode. See Appendix G, Stealth Modes.

TAB E – Stealth Modes

1. There are a variety of stealth modes available to the battle master. These modes allow the battle master to move about the synthetic battlefield without being seen by the Soldiers on the Soldier stations. The various views and movement capabilities are covered in this TAB.

2. There are two means to access the stealth modes. One is through the use of the joystick. Each mode discussed will also include how to access the mode through the use of the joystick. The second method is through the SVS dialog window, via the Stealth menu selection. See Figure 28.

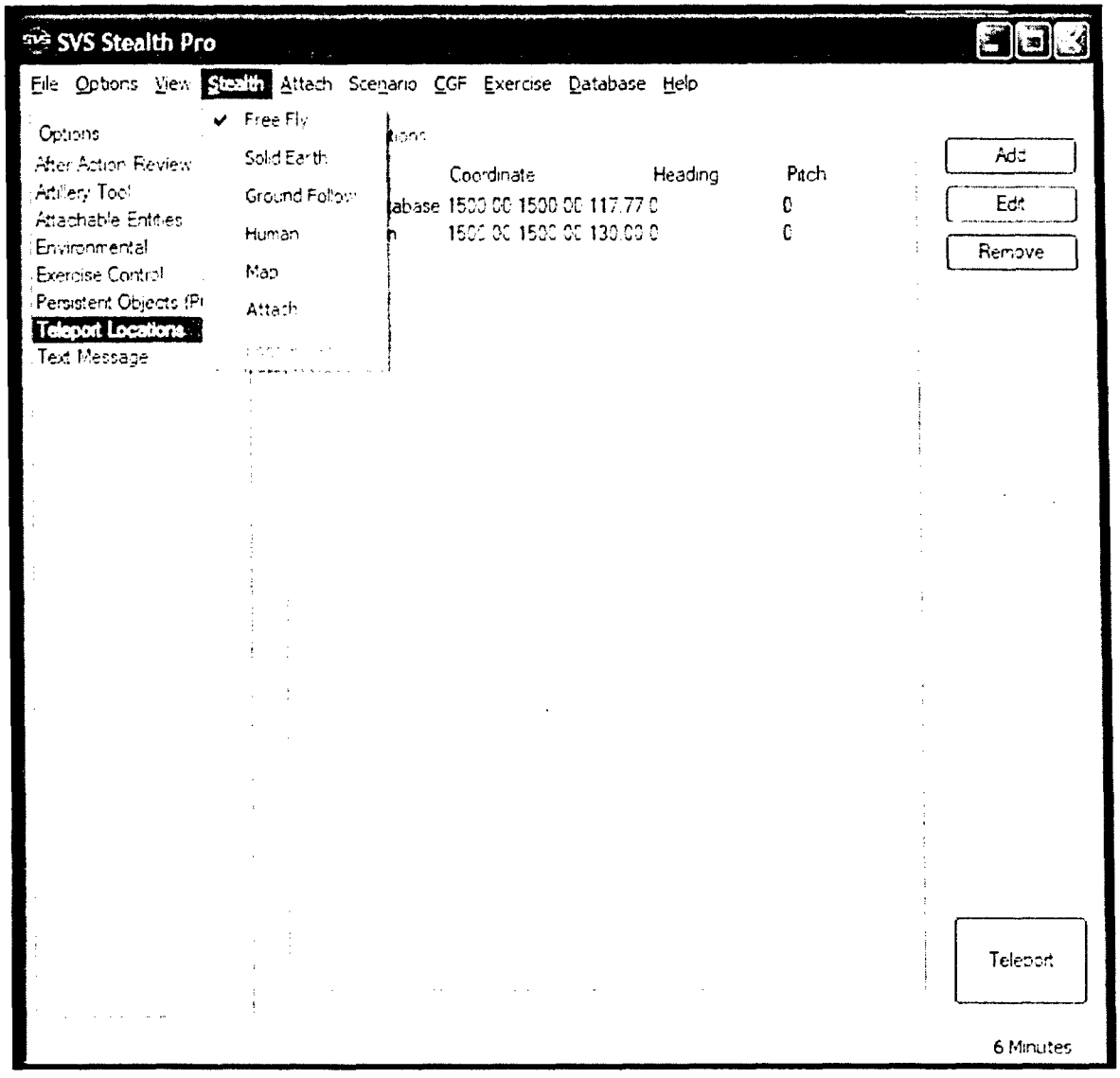


Figure 28. Stealth Mode Selection Menu.

3. There are a total of five stealth modes. They are free fly, solid earth, ground follow, map, and human. The 'attach' mode indicated in Figure E-1 is a different function.
   a. Free Fly is accessed via the joystick by pressing the #4 button on the joystick, and cycling through until you show Free Fly in the upper left portion of the screen. See Figure 29. Free Fly allows the battle master to move freely around the synthetic battlefield, as if flying. The #3 button on the joystick allows the battle master to loose altitude, and the #2 button allows the battle master to gain altitude. By decreasing altitude, the Free Fly function allows the battle master to actually go below the surface plane and see underground (to locate vehicles that are at hull or turret defilade) and to look from the ground up into buildings. Free Fly also allows the battle master to move generally more quickly around the synthetic battlefield than other modes.

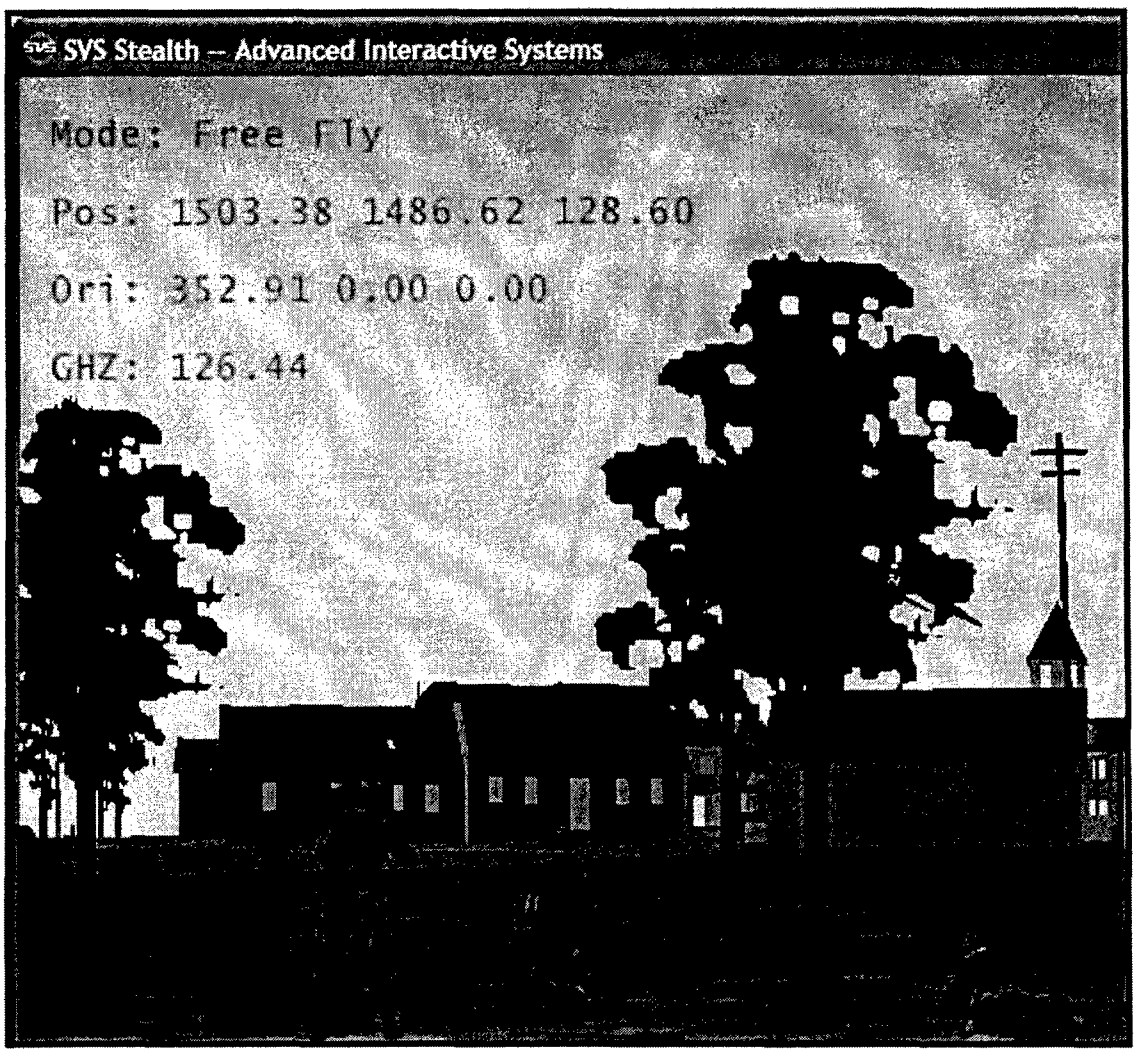


Figure 29. Free Fly Mode.

   b. The Human mode is accessed via the joystick by pressing the #5 button and cycling through the other modes (except Free Fly). The Human Mode allows

the battle master to move only as fast as a Soldier can move across the synthetic battlefield. The advantage of the Human Mode is that the battle master can move with ground troops to observe their actions and not over or under run them.

c. Solid Earth and Ground Follow are very similar, and are accessed by cycling through the #5 button on the joystick. Whatever altitude the battle master selects over the ground, the view for those modes of stealth will maintain whatever the set distance is above the ground. As a result, it is similar to flying nap of the earth over the ground. The advantage to these modes is that it allows the battle master to move quickly, but maintain a similar perspective view as that of the Soldiers in SVS.

d. The Map mode allows a map view of the synthetic battlefield. The battle master must adjust altitude using the #2 or #3 buttons on the joystick. The Map mode does not allow diagonal movement, and the hat on the joystick (the B button) is not functional. Fast movement is allowed, however the higher the altitude the slower the motion seems. The Map mode is useful during after action reviews and a screen capture has been made and saved to review with the subjects of the experiment. It is also useful to obtain overhead views that are not possible in another mode.

4. All these modes are accessible through the dialog window as shown in Figure 28.

5. Other modes that are not related to view modes are accessible through the use of the joystick buttons that are not available in any other mode than stealth. By cycling through the #4 button, the battle master can start the scenario, pause the scenario, end the scenario and reset the scenario. Once the desired mode is on screen, the battle master can activate these modes by selecting the #5 button on the joystick.

TAB F –Artillery Tool

1. Purpose. This TAB outlines the procedures for the battle master to introduce artillery fires into the experiment if required. The battle master can use both BLUFOR and OPFOR ammunition in the execution of indirect fires. Preplanned fires cannot be saved, therefore must be preset the day of the experiment.

2. The Artillery Tool is the interface the battle master will use to plan for and execute artillery fires during the conduct of an experiment. The Artillery Tool is shown below in Figure 30.

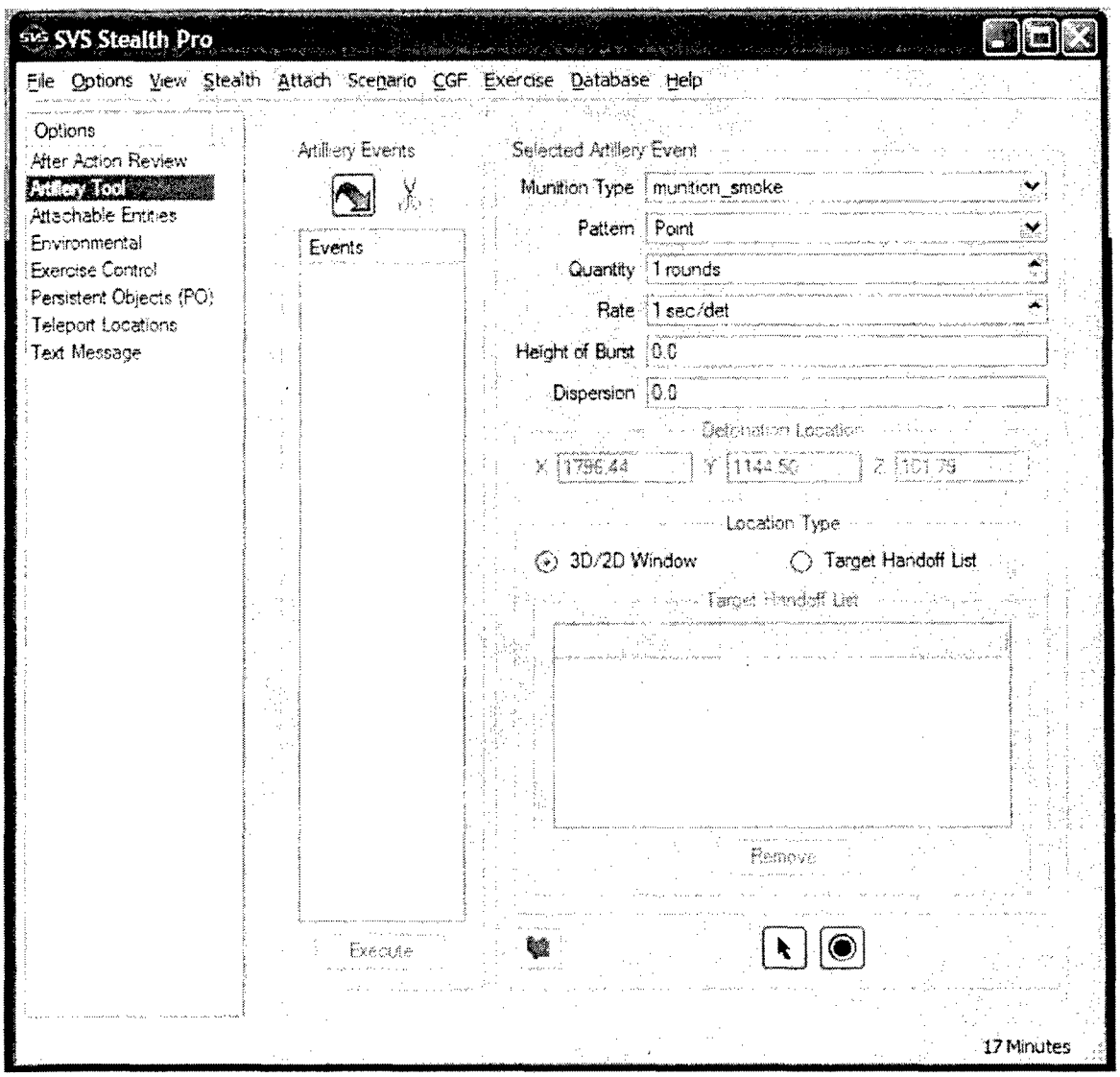


Figure 30. Artillery Tool.

3. To select the Artillery Tool, simply click on it in the options window or by selecting Options and then Artillery Tool.

4. It is not possible to save preplanned fires, so they must be programmed on the day of the exercise on the Battle Master Station (Station 1). In order to set up pre-planned fires, please follow the instructions below.
   a. Click on the green arrow in the column labeled Artillery Events. When you click on it, the area labeled Selected Artillery Event will become active. See Figure 31.

Figure 31. Artillery Events.

   b. In the Select Artillery Events area, select the type of munitions that will be used in the artillery event. See Figure F-3. Both BLUFOR and OPFOR fires can be planned.

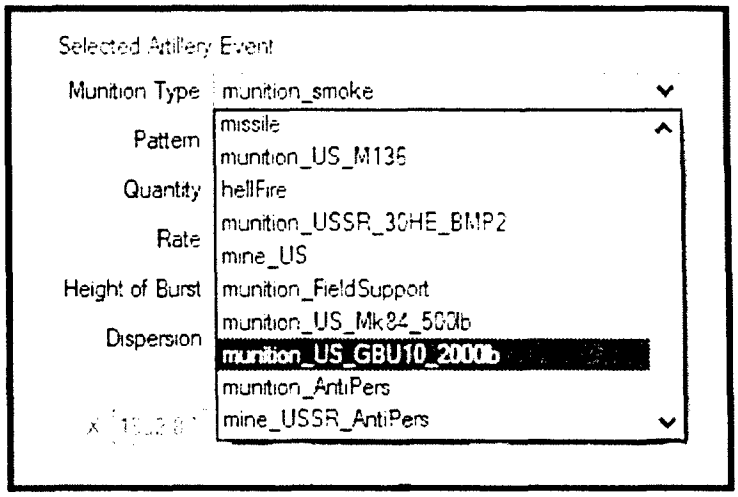


Figure 32. Munitions Selection

   c. Next, select pattern. Always use the selection default of Point. See Figure 33.

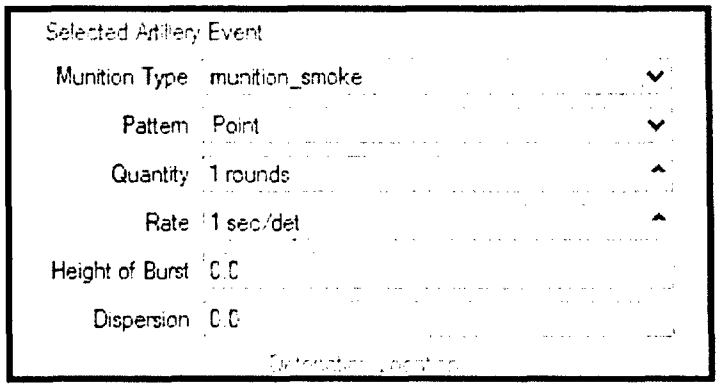


Figure 33. Other Artillery Event Options.

   d. Select the number of rounds to be fired during that event. For example, if you were to have a battery firing the mission, 6 rounds would be appropriate. If it is an F-16 dropping a 500 pound bomb, one to two rounds would be appropriate. If the munitions are being delivered by a platoon of Paladins, two rounds would be appropriate.
   e. Select the rate of fire. If the target was planned for a platoon of Paladins, and three volleys were to be fired, you would select 3 seconds, and change the Quantity to 6 (six total rounds fired in a total of 3 seconds).
   f. If airburst is desired set the height of burst (in meters). Normal artillery air bursts are set for 10, 20, or 50 meters. Ten meters is the most common.

g. Dispersion of the rounds (in meters) must then be set if more than one round is to be fired. Normal dispersion for artillery is 50 meters and for mortars 25 meters.
h. Disregard the Destination Location windows with X,Y, and Z tangents.
i. To give the artillery pre-planned locations select the 3D/2D Window radio button. See Figure 34.

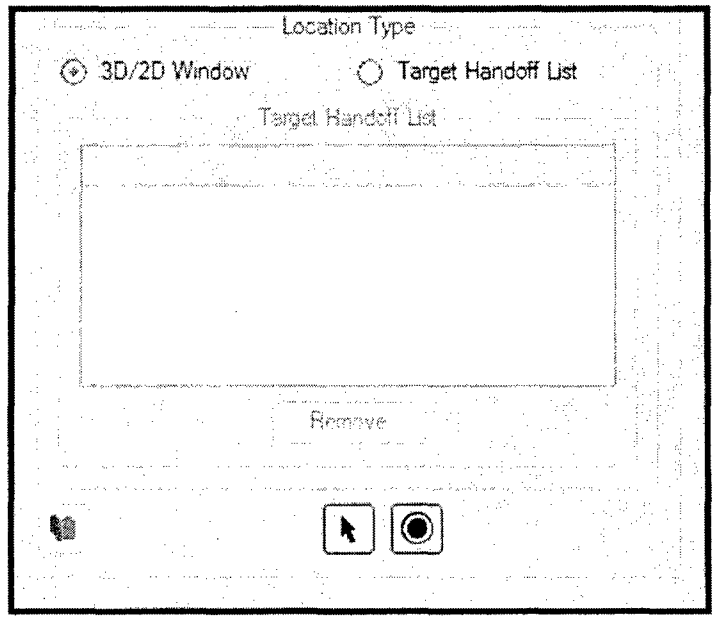


Figure 34. Artillery Event Location.

j. Once the 3D/2D Window radio button is selected, then select the round radio button to the right of the arrow shown in Figure 34. When you select the radio button, a dialogue box pops up with instructions to click on the screen. Click the exact location on the 3D screen where the artillery event should take place. Select center of mass if rounds will be dispersed. Click ONLY one time. (If you click more than once, more than one event with the same data will be recorded into the Artillery Events window. Once you have selected the location for the event the dialogue box should close and take you back to the artillery tool.
k. You should notice that in the Artillery Events area of the screen, a numbered event is listed. Once that shows on the screen select the book icon to the far left of the arrow in the area labeled Location Type. This will save the artillery event to the virtual memory. It is strongly suggested that you make a note of what the mission is, the event number, and whether it is BLUFOR or OPFOR supporting fires.
l. If the event must be changed or edited, you can click on the event in the Artillery Event window and the data for that event will show under Selected Artillery Event. Make the changes needed and then click on the book icon as before.
m. If the computer must be shut down for any reason, these artillery events will no longer be in virtual memory.

n. In order to execute an artillery event, click on the desired artillery event in the Artillery Event window and then click on the Execute button. See Figure F-1. Each time the execute button is clicked, the event will occur, so be especially careful about double clicking. One click is all that is needed.

5. Immediate artillery missions can be performed by using the same process up to step 4j listed previously. Instead of selecting the round radio button to the right of the arrow, select the arrow. The same dialogue window will pop up. Then select on the target location. The artillery event will occur at the instant the desired location is clicked. As long as the artillery tool is selected each time the screen is clicked using the mouse, the last artillery event will occur. To prevent this, select another option and minimize the window.

TAB G – Suspense Matrix

1. Purpose: The Suspense Matrix delineates who is responsible for submitting what and when, and the actions they are required to take prior any Warfighting experiment in the Warfighting experimentation lab.

2. Suspense Matrix:

Table 2. Suspense Matrix

Who	When	What	To Whom	Action
Research Scientist or SME	**90 days prior to the experiment**	Troop Support Request	DOT	Submit a troop support request for the subject personnel of the experiment.
Research Scientist	**15 days prior to the experiment**	Research Plan	SME	Develop scenario, any training support package, a master events list, communications plan, and callsign list
SME	10 days prior to the experiment	Scenario and master events list	OTB Operator	Program BLUFOR, OPFOR entities, entity actions, and ViSSA set up
SME	10 days prior to the experiment	Communications plan and callsign list	OTB Operator	Program communications model, make callsign boards
	3 days prior to the experiment	Test program of BLUFOR and OPFOR entities, and test communications	Review with SME	Take any corrective actions required
OTB Operator	Day of experiment	Run OTB, DACS, and ViSSA	NA	NA
SME	Day of experiment	Run SVS Stealth, program SVS Soldiers (weapons and ID markers), and artillery tool (pre-planned missions)	NA	NA

Who	When	What	To Whom	Action
Research Scientist	Day of experiment	Observe experiment	NA	NA
SME	Day of experiment	Conduct AAR for subjects	NA	NA
OTB Operator	Day of experiment	Backup all data to CD-ROMs	Research Scientist	Review and analyze data
Research Scientist	Day after experiment	Do an initial review of data	OTB Operator	Tell them if they need to redo data or if they can clear the system
OTB Operator	Within one week after experiment	Back up data for lab files and clear the system of old data	NA	Archive data

TAB H – Acronyms

1SG – first sergeant
A/C - aircraft
ARI – Army Research Institute
ARV-A – Armored Reconnaissance Vehicle - Assault
ASTi – Advanced Simulations Technology, Incorporated
BLUFOR – blue (friendly) forces
C4I – Command, control, communications, computers, and intelligence
CD-RW – compact disc rewritable
CEOI – communications electronics operating instructions
DACS digital audio control system
DOT – Directorate of Training
DVD – digital video drive
FBCB2 – Force XXI Battle Command, Brigade and Below
GB – gigabyte
GHz – gigahertz
HE – high explosive
HHT – hand held terminal
HQ - headquarters
ICCC – Infantry Captains' Career Course
ID - identification
IOBC – Infantry Officers' Basic Course
IFRU – Infantry Forces Research Unit
JRTC – Joint Readiness Training Center
LD/LC – Line of Departure/Line of Contact
MEDEVAC – Medical evacuation
MDMP – Military decision-making process
MOPP – military oriented protection posture
MOUT – military operations in urban terrain
NCO – non-commissioned officer
NCOIC – non-commissioned officer in charge
NIC – network interface card
NTC – National Training Center
OneSAF – One Semi-Automated Force
OPFOR – opposing forces
OPORD – operations order
OS – operating system
OTB – OneSAF Testbed Baseline
PL – platoon leader
PSG – platoon sergeant
RAM – random access memory
RIU – remote interface unit
ROE – rules of engagement
SA – Situational Awareness
SFC – sergeant first class

SME – Subject matter expert
SVS – Soldier Visualization System
UAV – unmanned aerial vehicle
ViSSA – virtual Soldier simulation assessment

NOTE: OneSAF OTB is commonly used together, although when translated becomes redundant. This is the common use and reference to the OneSAF testbed baseline.

TAB I – Sample Experiment Plan

1. Purpose. The purpose of providing a sample experiment plan is to further provide a guide with an example of what must be accomplished, and what format it should take. It includes enclosures for the various documents and actions that must be taken to create and execute an experiment.
2. Duties and Responsibilities. Duties and responsibilities are well defined in the basic document and in TAB G, the Suspense Matrix. They are further amplified below in paragraph 3f, Experiment Support Plan, where it is believed that additional support personnel would be required for the experiment.
3. Key Elements of an Experiment Plan.
   a. Troop Support Request. Submitted most likely by the research scientist to the Directorate of Training at the Infantry Center. The request should state how many Soldiers are required, of what grade and experience, and for how long, and what it is they are expected to do. See Enclosure 1, Troops Support Request.
   b. Research Plan. The research plan can be as simple or as complex as the research scientist wants. The research plan, should, as a minimum, consist of the question to be answered by the conduct of the experiment and it must deal with either human behavior or training and the instrument by which the experimental behavior is judged. A sample research plan is contained at Enclosure 2, Research Plan.
   c. Scenario. There must be a scenario and supporting documentation for the subjects to use to develop plans and execute the experiment. It should also include a master events list. A sample scenario can be found at Enclosure 3, Experiment Scenario.
   d. Communications Plan. The communications plan is required to allow the OTB operator to program the DACS, and to include anything beyond the normal communications, such as jamming, poor communications, etc. The plan must also include a CEOI extract. A sample communications plan is found at Enclosure 4, Communications Plan.
   e. SVS Soldier Configuration Plan. This must be spelled out prior to the exercise to ensure that it is both accomplished, and that there is data to indicate who was armed with what type weapons and signal devices for post experiment reviews. Since the system allows for visual signals and environmental impacts, these should also be spelled out in the configuration plan. The SVS configuration plan for this experiment is at Enclosure 5, SVS Soldier Configuration Plan.
   f. Experiment Support Plan. The SME must review who will be performing what duties. If normal action and activities are planned, then the guide can be used as a standard operating procedure. If the SME believes that the OTB operator may be overwhelmed by trying to operate the OTB and the logger, and the research scientist must be free to observe the experiment, then a fourth person would need to be added to operate the logger. This person should be a competent typist so that they may enter data into the comments area of the logger quickly as the situations develop. If the SME believes that he will need

assistance in answering radio calls from the subject leader, such as other platoon leaders, he may also desire to add another SME to assist him with this function. The SME felt that for this experiment both would be needed, and the sample plan is found at Enclosure 6, Experiment Support Plan.

g. Entity Requirements List. A sample of the entity requirements list and scenario is shown at Enclosure 7. The list must include a code for each unique entity. This is required to allow identification of each entity, rather than "that Stryker" or "that technical vehicle", which would only add to the confusion. The columns shown in the sample are provided as a possible format. For new vehicles or entities that are not in the OTB, the replacement vehicle and the vehicle being replaced should have the same characteristics. In other words, it would not be correct to replace a Bradley Fighting Vehicle with a Stryker. A better match would be to replace the LAV with the Stryker, since they are both armed wheeled vehicles with about the same armor thickness. As entities are set up, it has been discovered that BLUFOR should have an effectiveness rating of 100% and the OPFOR an effectiveness rating of 25%. WARNING: Do not plan to use more than 300 entities total, as this will use excessive memory on the stations. The resulting loss of memory causes display problems, such as vehicles and OPFOR displaying when the avatar is right on them. Using more than 300 entities also creates a situation with the OTB, which will not save more than 300 entities. Keep in mind that one nine man squad is not a single entity, but nine entities.

Enclosure 1
DAPE-ARI-IJ XX January 200X

MEMORANDUM FOR Directorate of Operations & Training Division, ATSH-OTD, ATTN: Mr. R.Vickery, Fort Benning, GA 31905

SUBJECT: Army Research Institute (ARI) Troop Support Request Coordination

1. PURPOSE: To request troop support from the Infantry Officer Basic Course (IOBC) and the Infantry Captain's Career Course (ICCC).

2. ARI will conduct a series of computer simulation experiments designed to examine how to train critical skills required for the planning and employment of the Armored Reconnaissance Vehicle – Assault (ARV-A) as part of the Future Force Warrior and Future Combat Systems. The experiment requires support from Soldiers attending IOBC, who have completed platoon tactics and from Soldiers attending ICCC who have a basic understanding of infantry tactics and doctrine. Tasking statements to these organizations should be based on the criteria prepared below.

3. Subparagraphs a and b identify the tasking requirements.

a. IOBC.

(1) Eight (8) students from IOBC, preferably after they have completed platoon tactical training. They should not have prior enlisted experience, and be evaluated as being in the upper 20% of their IOBC class academically.

(2) Schedule students for **two sessions.** Both groups will be required for two consecutive days each. One 4-hour session on Day One, covering one hour of instruction on the simulation and 3 hours for MDMP, and Day Two consisting of one 8 hour session should be scheduled with 4 students participating in the session. One two day session, with 2 hours of instruction on Future Force Warrior robotics planning and employment, followed by one hour of instruction on the simulation, and 3 hours of MDMP in the first day (6 hours total), and the second day with 8 hours of practical exercise on the simulation should be scheduled for the remaining 4 students.

(3) Request transportation be provided to transport Soldiers to Building 75. Students will report to Dr. Ken Evans, in ARI, on the second floor.

(4) The target dates are from 9 – 25 May. Exact date will be determined through the POCs.

b. ICCC

DAPE-ARI-IJ
SUBJECT: Army Research Institute (ARI) Troop Support Request Coordination

(1) Eight (8) students from ICCC at any point during their training cycle.

(2) The students should be divided into two groups of four students each. Each group will be required for two days. The first group will participate in one 4-hour session on Day One, consisting of one hour of instruction concerning the simulation and a 3 hour period dedicated to MDMP. Day Two will consist of an 8-hour session of experimentation and practical exercise on the simulation. The second group will also participate in a two-day session with the first day consisting of 2 hours of classroom training on the planning and employment techniques of the ARV-A, one hour of instruction and familiarization on the simulation, and three hours of MDMP, for a total of 6 hours. The second day will consist of 8 hours of practical exercise on the simulation.

(3) Request transportation be provided to transport Soldiers to Building 75. Students will report to Dr. Ken Evans, in ARI, on the second floor.

(4) The target dates for this effort are from 9 - 25 May. Exact date will be determined through the POCs.

4. POC is Dr. Ken Evans 545-2565 or Mr. Steve Livingston, 565-1811.

SCOTT E. GRAHAM
Chief

Enclosure 2 – Research Plan

1. Problem Description. The Army is seeking to determine the best method to train Future Force Warrior skills, tactics, techniques, and procedures.
2. Objectives. Determine the most efficient method of training and education concerning the planning and employment of the Armored reconnaissance vehicle – assault (ARV-A) for company grade officers.
3. Research Approach. Conduct four sessions of different durations with both inexperienced infantry lieutenants that have had tactical training, and experienced infantry lieutenants and captains. These groups will be divided into Group 1 through 4, with the make up as follows:
    a. Group 1. Students of the Infantry Officer's Basic Course (IOBC), which have no prior enlisted service, and have completed their platoon tactical training in IOBC. The total of students is four. Group 1 will attend a total of 12 hours of training in the ARI Warfighting Experimentation Lab. Prior to performing the simulations in four rotations, they will be given a briefing concerning the capabilities and limitations of the ARV-A. They will then be allowed to practice on the simulation. Group 1 will then use a company operations order and other pertinent information concerning Mission, Enemy, Terrain, Time, Troops Available, and Civilian Considerations (METT-TC). They will plan for and employ the ARV-A in support of their military mission. The will be given a total of 3 hours on the first day to perform Troop Leading Procedures and develop their orders. They will be evaluated using the instrument found within this enclosure.
    b. Group 2. Students of the Infantry Officer's Basic Course (IOBC), which have no prior enlisted service, and have completed their platoon tactical training in IOBC. The total of students is four. Group 2 will attend a first day session that will consist of 2 hours of formal instruction concerning the planning and employment of the ARV-A, then a 1-hour session of familiarization on the simulation, and then three hours to read the order and develop their plan (troop leading procedures). The second day will consist of 8 hours of practical exercise on the simulation. They will then be allowed to practice on the simulation. Group 2 will then use a company operations order and other pertinent information concerning Mission, Enemy, Terrain, Time, Troops Available, and Civilian Considerations (METT-TC). They will plan for and employ the ARV-A in support of their military mission. They will be evaluated using the instrument found within this enclosure.
    c. Group 3. Students of the Infantry Captain's Career Course (ICCC), which should have extensive experience in platoon tactics and doctrine. Group 3 will attend a total of 12 hours of training in the ARI Warfighting Experimentation Lab. Prior to performing the simulations in four rotations, they will be given a briefing concerning the capabilities and limitations of the ARV-A. They will then be allowed to practice on the simulation. Group 3 will then use a company operations order and other pertinent information concerning Mission, Enemy, Terrain, Time, Troops Available, and Civilian Considerations (METT-TC). They

will plan for and employ the ARV-A in support of their military mission. They will be evaluated using the instrument found within this enclosure.

d. Group 4. Students of the Infantry Captain's Career Course (ICCC). The total of students is four. Group 4 will attend a first day session that will consist of 2 hours of formal instruction concerning the planning and employment of the ARV-A, a 1-hour session of familiarization on the simulation, and will be given three hours to perform troop leading procedures. The second day will consist of 8 hours of practical exercise on the simulation. Group 4 will then use a company operations order and other pertinent information concerning Mission, Enemy, Terrain, Time, Troops Available, and Civilian Considerations (METT-TC). They will plan for and employ the ARV-A in support of their military mission. They will be evaluated using the instrument found within this enclosure.

4. Utilization. The outcome will contribute to the formalization of the Army Training Plan and Strategy for Future Force Warrior robotics.
5. Schedule of Events.
   a. Day 1. Group 1. 4 hours. Familiarization and MDMP/Troop Leading Procedures.
   b. Day 2. Group 1. 8 Hours. Simulation.
   c. Day 3. Group 2. 6 Hours. Instruction, Familiarization, and MDMP/Troop Leading Procedures.
   d. Day 4. Group 2. 8 Hours. Simulation.
   e. Day 5. Group 3. 4 hours. Familiarization and MDMP/Troop Leading Procedures.
   f. Day 6. Group 3. 8 Hours. Simulation.
   g. Day 7 . Group 4. 6 Hours. Instruction, Familiarization, and MDMP/Troop Leading Procedures.
   h. Day 8. Group 4. 8 Hours. Simulation.
6. Instruments.
   a. Demographic questionnaire. To be published.
   b. Experiment Evaluation Form. To be published.

Enclosure 3

Consolidated Incident List for Platoon Operations

Master column provides a framework to drive the scenario. Incidents in the **optional** column may be inserted to gauge leader responses. **Potential consequences/notes** lists possible outcomes of the incident and suggestions for when to use this particular incident. This incident list is the master framework to drive the scenario. It should be supplemented by routine SITREPs and progress reports from the subordinate leaders.

Movement		
Master	**Optional**	**Potential Consequence/Notes**
	20 % (=/< 25%) of unit internal commo (radio/LW/FBCB2/GPS) systems inoperable at start of mission	1. No commo w/ 20% of unit 2. No SA with 20% of unit (GPS locations, etc.) 3. Leader should direct the redistribution of resources.
Higher Cdr informs Cdr/ Leader that lead element crossing LD		
Higher Cdr directs Cdr/Leader to initiate movement.		
	Preceding Co in movement reports estimated 8 personnel, moving south, in combat formation, vicinity a recognizable terrain feature/control measure, dressed as civilians, carrying small arms	React to a potential threat.
	Enemy patrol sighted by subordinate element (can vary the location).	1. Could be armed personnel reported previously. 2. Additional enemy in AO not previously reported. 3. Subsequent reports should be rendered.
	Break in contact with a subordinate element	1. If leader does not reestablish contact, element remains lost for duration of scenario. 2. If leader takes steps to reestablish contact, elements links-up and scenario continues.

Master	Optional	Potential Consequence/Notes
	Lead element is ambushed by enemy patrol (6 to 8 personnel).	1. Leader should determine size and nature of the threat force. 2. Unit performs appropriate Battle Drill 3. Subsequent reports should be rendered. 4. Leader provide support, if needed/requested.
	Subordinate element requests MEDEVAC for personnel injured (in ambush or accident)	1. Cdr/Leader should forward MEDEVAC request or direct evacuation by alternate/ ground means. 2. If MEDEVAC request not forwarded or no action taken, Soldiers die (+/- 20 minutes after the initial report).
	HQ section receives sniper fire.	1. Must perform Battle Drill (Soldiers/robot) 2. Subsequent reports should be rendered. 3. If casualties are assessed, MEDEVAC should be required.
	Lead element encounters a minefield.	1. Must halt unit or alter unit course, inform subordinate elements, and request support (engineers) or direct actions to mark/bypass. 2. Use robot/UAV to recon; use robot to clear minefield. 3. Obstacle and bypass or route should be reported to higher HQ.
	Point element encounters several (4-5) dead animals.	1. Possible chem/bio hazard – take action to upgrade unit MOPP. 2. Detour / bypass / mark area 3. Report hazard and actions to higher HQ and alert adjacent forces.
	Subordinate leader with the lead element had lost contact with his point man. The Soldier was discovered nearly unconscious with extreme swelling of his right hand and appears to have been bitten by a snake or spider.	1. Cdr/Leader should take action to get medic forward and may initiate a MEDEVAC request or direct evacuation by alternate/ground means. 2. If MEDEVAC request not forwarded or no action taken, Soldier dies (+/- 20 minutes after the initial report).

Master	**Optional**	**Potential Consequence/Notes**
Lead element reports crossing phase line/or control measure ( )		Cdr/Leader should forward report to higher HQ.
	Higher HQ requests SITREP.	Can be used at any time to: 1. Assess leader SA. 2. Encourage leader action. (Determine if the Cdr/Leader must query subordinates before responding. Ensure that SITREP reflects accurate information.)
	Lead element encounters civilian woman and three children.	Leader should direct actions under the ROE to reduce unit vulnerability and protect civilians.
	Subordinate unit observes or hears a flyover by a possible UAV.	Leader should report incident, verify if friend or foe, and if foe, take action to reduce the units exposure/signature.
	Subordinate element receives indirect fire.	1. Perform battle drill. 2. Recover/treat wounded. 2. Must employ security measures for area currently occupied.
	Subordinate unit observes/hears activity (possible enemy) on a ridge approx. 700 meters from the movement route.	The leader should: 1. Report activity to higher HQ. 2. Take actions to confirm or deny hostile activity (robotic system/friendly element)
	Subordinate element reports receiving sniper fire.	Leader should direct appropriate action to eliminate the threat.
	Higher Cdr dies (sniper) (XO cannot be informed)	1. Cdr/ Leader should assume command until designee can take over. (Measures Cdr/ Leader understanding of OPORD and mission.)
	Radio jamming	Use at any time to apply pressure to leader (not

	(w/ higher HQ)	recommended for marginal leader).
Master	**Optional**	**Potential Consequence/Notes**
	Selected route has obstacle stream that unit vehicles (Stryker/ARV-A) cannot cross	1. Use when lead unit arrives at obstacle (not recommended for marginal leader). 2. Must determine a bypass and/or modify plan. 3. Must report actions to higher HQ and inform subordinate leaders.
	1 or 2 unit vehicles (Stryker) break down, become stuck in mud or entangled in wire	Can be used at any time to apply pressure to leader. 1. Must modify plan. 2. Must report situation to higher HQ and inform subordinate leaders.
	Unit receives MIJI (jamming/ interference) on the primary internal communications.	1. Leader should report the incident to higher HQ. 2. Direct actions to reduce or operate through the interference (change to alternate frequency, increase transmit power, etc.)
	Unit is nearing the assault/support by fire positions. Subordinate leader requests confirmation of enemy positions at a specific location on his portion of the objective.	The leader should: 1. Request information from higher HQ. 2. Focus his leaders recon or available RSTA asset to satisfy the requirement (UAV, robot, etc.).
B Co in position; SITREP		Control measure for BN to control operation (can be used to apply pressure if leader is moving too slowly).
C Co in position; SITREP		Control measure for BN to control operation (can be used to apply pressure if leader is moving too slowly).
Lead element reports reaching assault or support by fire position.		1. Signifies the end of movement phase and beginning of OBJ phase. 2. Cdr/Leader should determine/verify location and status of other elements. 3. Cdr/Leader should report when all elements are ready.
During Actions on the Objective		
Higher Cdr reports all other units in position and directs initiation of attack.		

Master	Optional	Potential Consequence/Notes
	Higher HQ fire support (mortars) are reported as not available to provide supporting fires on the OBJ.	Cdr/Leader should request aircraft if required.
	If requested, fire support (mortars/artillery/ A/C) engages the wrong grid and impacts friendly troops (other unit).	Used to apply pressure to the leader.
Early Report: Lead element reports location of (large ammo store [6 pallets of 122-mm Arty] or CUDO laser device).		This is only part of mission; Cdr/Leader should direct continuation of mission and securing of OBJ.
	Subordinate leader killed in firefight.	1. Cdr/Leader should ensure that a subordinate takes control of the element. 2. Cdr/Leader should report the loss of a key leader. 3. Consider modification of own or 2IC's position to compensate for loss.
	Adjacent or subordinate PL becomes victim of combat stress.	Cdr/Leader should try to calm PL; possibly ensure subordinate takes control of PLT.
	Subordinate unit reports capture of eight (8) probable enemy Soldiers: 1 is in civilian clothes but appears to be in authority. 2 are wounded (medical urgent) and require MEDEVAC.	The leader should: 1. Report the situation to higher HQ. 2. Provide guidance to the subordinate unit. 3. Take action to forward the MEDEVAC request.
	Tank discovered (in hangar or camouflaged position).	Cdr/Leader should direct action to disable/secure tank.
	Bomb found (can vary location)	React to unexpected situation (use Soldiers/robot)
	Civilian official encountered/liberated by subordinate element; reports hostages being held near by at	Cdr/Leader must know ROE and assess his ability to assist based on mission requirements. Report should be forwarded to higher HQ and civilian official detained.

	McKenna and demands action.	
Master	**Optional**	**Potential Consequence/Notes**
	Higher HQ reports that the bombs on enemy reaction force missed/ ineffective. Location of the enemy mobile reaction force is unknown.	1. Leader should recognize the potential threat. 2. Leader should alert subordinate units.
	Co in the blocking position to the east reports heavy counter attack. Mobile enemy elements (technical vehicles) and infantry are attempting to bypass.	1. Leader should recognize the potential threat. 2. Leader should alert subordinate units and adjust AT weapons or units to decrease reaction time to the threat.
	Cdr's commo or SA display crashes (radio/LW/FBCB2)	Leader looses SA with unit; should employ voice commo to supplement his SA and move to another system.
	Subordinate element reports finding tunnel entrance; requests instructions.	The Cdr/Leader should: 1. Provide instructions to the element based on METT-TC and status of mission accomplishment. 2. Report situation to higher HQ.
	Enemy detected in tunnel.	1. Cdr/ Leader should react to contain and pursue enemy threat within ROE. 2. Direct forces and/or robotic devices to recon/engage.
	Barrels w/chemical markings found on the OBJ.	Cdr/Leader should: 1. Direct increase in MOPP. 2. Report the situation to higher HQ. 3. Initiate testing/monitoring with subordinate element or robotic system to determine agent(s) and hazard.
	Higher HQ reports that Co in the blocking position to the east has been bypassed. Enemy forces are capable of counterattacking from the southwest.	Leader should alert subordinate units and adjust AT weapons or units to decrease reaction time to the threat.
	Higher HQ reports 6 to 8 medium enemy helicopters are enroute into the AO from the south.	Leader should alert subordinate units and adjust automatic/air defense weapons or units to decrease reaction time to the threat.

Master	**Optional**	**Potential Consequence/Notes**
	Subordinate unit encounters accurate long-range fires from enemy bunker beyond the objective area. Fires make it impossible to continue/complete mission. Unit is unable to suppress/ engage the bunker.	The leader should: 1. Report the situation to higher HQ. 2. Take actions (indirect effects/maneuver of other units) to eliminate the threat.
	Higher HQ directs Co Cdr to send a PLT to assist B Co	1. Cdr/ Leader must shift assets to ensure his mission accomplishment.
	F18 crashes 3 km north of OBJ (suspect contaminated fuel); Cdr/ Leader is directed to secure the crash site. (Platoon mission.)	Cdr/Leader must develop a hasty FRAGO to handoff the mission and change the mission of subordinate elements.
	Higher HQ reports that the F18s have returned to their carrier for refuel.	Recognize that A/C not available for fire support.
	Higher HQ requests SITREP.	Can be used at any time to: 1. Assess leader SA. 2. Encourage leader action. (Determine if the Cdr/Leader must query subordinates before responding. Ensure that SITREP reflects accurate information.)

Enclosure 4

Ft. Benning Terrain
(GT1A_1B)

1. Military Aspects of Terrain and Wildlife.

a. Observation and fields of fire: Conditions vary from excellent during late fall, winter, and early spring to poor during late spring, summer, and early fall because of the seasons and variation of the foliage. The terrain in the area of operation consists of gently rolling hills with streams and intermittent streams throughout the area. The vegetation on the high ground consists of adult pine and hard wood forest. Planted pine nurseries of 5 to 30 acres are common throughout the area. The area has an active forest management plan with controlled burning every two years that has restricted the undergrowth throughout the high ground. However, the marshy low-lying areas have very thick undergrowth that will restrict observation, fields of fire, and movement of all kind.

Most named streams begin at manmade lakes/ponds and flow southwest to the Chattahoochee River. There are numerous swamps in the low areas and adjacent to most of these streams. All streams and swamps in the area are fordable by light infantry and range from ankle to waist deep with a soft muddy bottom. These low swampy/marshy areas will restrict both friendly and enemy vehicle traffic. Dismounted movement through these areas will require additional time to maintain stealth.

b. Cover and Concealment: Cover and concealment vary as much with the seasons as do observation and fields of fire. Care should be utilized during planning to select the appropriate route depending on the season and its associated vegetation. The adult planted pine forests provide adequate cover for dismounted movement, but are lacking for ground and air concealment. The low-lying areas provide good concealment with thick undergrowth, but there is very little cover. With careful route selection the rolling hills and drainage patterns can be used to mask mounted and dismounted movement. There are numerous gorges created by rain runoff throughout the area. These gorges have near vertical sides and may range in depth from 2 feet to 60 feet.

c. Obstacles: Along with natural obstacles the terrain is very conducive for man-made obstacles canalizing the attacker. The sand and red clay soil excavates and packs well requiring little obstacle maintenance. The marshy low-lying areas will restrict vehicular movement to the higher elevations. While military wheeled or tracked vehicles can ford all streams, finding an approach to the ford may prove a challenge.

There are two railroad lines in the area of operations, Central of Georgia and Seaboard Coast Line. Both railroads enter from the northwest and exit the area to the southeast. All railroads present major challenges for lateral movement. Railroad beds consist of tennis ball size loose rock with numerous cuts and fills. The railroad maintains a 15-foot right of way on either side of the railroad bed by using a defoliant to restrict undergrowth, creating fields of fire in excess of 2,000 meters. If crossing becomes necessary, the crossing point should be adjacent to

a bend in the railroad to limit enemy observation to one direction. Caution must be exercised to insure that vehicles do not become high-centered.

d. Key Terrain: Key terrain for this mission includes:

1. Mc Kenna Airfield (16SGL063836) is a 1000-meter (+/-) improved, semi-developed airfield capable of supporting up to AN-12 CUB/ C-130 Hercules fixed wing aircraft. The facility consists of a hangar, one admin/maintenance/billet building, a control tower, in- ground fuel storage facilities, and extensive ramp and parking space for troop marshalling or logistics operations.

2. Mc Kenna Village (16SGL065863), on dominate terrain and containing several multistory masonry structures, provides excellent observation of the surrounding area.

3. High ground vicinity 16SGL067866 is a hub for routes throughout the AO.

4. High ground vicinity 16SGL083850 is a hub for routes throughout the AO.

e. Avenues of Approach: There is an abundance of roads and trails traversing the area. These roads and trails vary from two lane blacktops, to 30-foot wide hard packed dirt, to 8-foot wide trails of very soft sand. However, all will support military vehicular traffic.

1. First Division Road is a light duty all weather improved dirt road approximately 30 feet wide. It should be considered a high-speed approach that traverses the area of operation from the west (vicinity railroad bridge 16SGL028860) to the north vicinity 16SGL045866, then turns to the east intersecting with Plymouth and Underwood Road vicinity 16SGL1287. In the east an unnamed road continues north as First Division Road turns east.

2. Hourglass Road is a light duty all weather improved dirt road approximately 30 feet wide. It should be considered a high-speed approach that enters the area of operation from the southwest (16SGL0582), traverses northeast (vicinity 16SGL0985), then turns due north to Eelbeck (16SGL1191).

3. Red Diamond Road is a light duty all weather improved dirt road approximately 30 feet wide. It should be considered a high-speed approach that enters the area of operation from the southeast and intersects with Hourglass and Buffalo Roads (vicinity 16SGL1085).

f. Wildlife: There are several species of wildlife in the area that may affect operations. Alligators are plentiful in the area. Most ponds have several, including the beaver ponds, many of which do not appear on the map. Alligators' young hatch in the early summer and are guarded by the female. These females have been known to attack boats that come between her and her young. Sightings of 10-foot alligators are common with some reaching 18 feet.

There are herds of feral hogs in the area. These herds feed in the low lying areas, with as few as 3 or 4 to as many as 15 to 20 hogs to a herd. Hogs are aggressive and have been known to "tree" local hunters for several hours before losing interest and leaving the area. The adult hogs are very protective of their young and will attack to protect their young. Female hogs will mate every six months having as many as 8 young in a litter, so any herd will have several young.

There are numerous coyotes in the area. Coyotes are nocturnal feeders and hunt as single animals; but when prey is found, the entire pack assembles for the kill.

There are several species of snakes in the area. However, only three are poisonous. The Cain Break Rattlesnake has a brown body with dark brown and black markings along it's back. It will grow to 5 feet in length and be as big around as a man's forearm. The Copperhead is also a brown bodied snake with dark brown markings along it's back. However, the Copperhead rarely reaches 18 inches in length and is normally as big around as a man's thumb. Both the Cain Break and Copperhead range the high ground and prefer rotting stumps and logs as hiding places. The Water Moccasin (Cottonmouth) is a grayish-bodied snake with dark gray to black markings along it's back. It will grow to 4 feet and be as big around as a man's forearm giving it a short and fat look. As the name indicates the Water Moccasin prefers water and will bite underwater. All three snakes' venom will render a healthy man deathly sick and may kill small children. If bitten, the individual should be evacuated as soon as the situation permits.

2. Effect on Enemy Courses of Action:

a. Attack: Motorized forces will have approach avenues limited only by water/swamp obstacles and rapid employments will be limited to the high ground and road network. Dismounted troops can negotiate the entire area of operations, although additional time will be required to navigate the swampy areas.

b. Defend: Defensive perimeters must provide 360^0 coverage. This will cause thinning the lines or smaller perimeters. The enemy has chosen to rely on rapid reaction forces for supporting their out-lying forces. The reaction force will attempt to reinforce defenses or engage any attacking force from the flank or rear, forcing the attacking force to fight on two fronts or to disengage.

3. Effect on Own Courses of Action:

a. Attack: As with the enemy, the terrain provides unlimited avenues of approach for dismounted infantry. Stealth and speed during the approach will assist in maintaining surprise. Caution must be used when selecting approach routes to avoid observation and possible engagement from the rear by the mobile mounted forces. A successful plan must include minimal exposure in the objective area and disruption or destruction of enemy reaction forces.

b. Defend: Once enemy forces in the objective area are defeated, the initial threat will come from reaction forces approaching along the high-speed routes. Extended occupation of the objective areas increase the probability of both infantry attacks and the likelihood of a major mounted force attack. Any withdrawal route should limit the enemy's vehicle pursuit by keeping a water obstacle between your forces and a high-speed avenue of approach.

Enclosure 5

Weather Data for Ft. Benning

2A (Ft. Benning 12 January)

High	56^0
Low	35^0
Wind	10 mph
Direction	Out of SE
Rain Showers	20 % PM

2B (Ft. Benning 12 July)

High	91^0
Low	71^0
Wind	20 mph
Direction	Out of SW
Rain Showers	20 % PM

Note: The factors listed in these tables can be modified to provide/create a situation that would require/restrict the use/employment of desired capabilities. Some examples include:

1. Changing the wind direction and speed would impact decisions to employ obscurants (smoke) (when/where used to create the required impact) and possibly the effectiveness of an unmanned aerial vehicle (UAV).

2. Increasing rain showers or having prolonged rain could make certain areas of the terrain impassable by mounted forces or restrict the use of an unmanned ground vehicle (UGV).

Enclosure 6

Light Data for Ft. Benning

2A (Ft. Benning 12 January)

	12 January	13 January
Sunrise		0742
Sunset	1754	
Moonrise	1331	
Moonset		0128
Moon Phase	3/4	
% Illumination	64%	
BMNT		0642
EENT	1854	

2B (Ft. Benning 12 July)

	12 July	13 July
Sunrise		0542
Sunset	2001	
Moonrise	1915	
Moonset		0409
Moon Phase	1/4	
% Illumination	16%	
BMNT		0440
EENT	2051	

Note: The factors listed in these tables can be modified to provide/create a situation that would require/restrict the use/employment of desired capabilities. Some examples include:

1. Decrease the % illumination and conduct an operation at night to force more dependency on sensors and optics for situations with reduced visibility.

2. From the weather section, include late night/early morning rain showers that will likely delay the actual illumination effects so the impact of sunrise will be later than shown in the table.

Enclosure 7

Indigenous Enemy Situation for Ft. Benning Missions
(GE1)

U. S. Joint Task Force (JTF) 626 (10th Corps) continues to conduct offensive operations against Gordonian's Army, La Ban Militia, and a loose Confederation of War Lords loyal to La Ban. JTF 626 and the Combined Allied Force supporting the Gordon Liberation Union are preparing to conduct a major offensive. This single envelopment of the 5th Gordonian Division will seize the critical rail and river transportation complex of Columbus (16SFL8994) and the Northern Chattahoochee Valley. This action will isolate the 5th Division and permit its defeat in detail depriving the La Ban of one-third of its heavy mechanized armed forces.

La Ban forces maintain control of towns and villages in the remote Upatoi River and Hichitee Creek Valleys. The Tibor Brigade remains Headquartered in Cusseta (16SGL0976) with the 1st People's Battalion. Small elements of the 2nd and 3rd People's Battalions are positioned throughout the region to control population centers, roadways, and critical facilities. The 3rd People's Battalion is generally north of Cusseta.

The 3rd Co., 3rd Peoples Battalion is Headquartered at McKenna Military Depot (16SGL056830) with the 1st (Cobo) Platoon. A platoon of technical vehicles (6 x SUVs and pick up trucks with heavy automatic weapons) has been attached to the 3rd Company. The technical platoon forms the primary element for the 3rd Company's immediate reaction force. Technical vehicles not on patrol in the vicinity of the Depot, the Airfield, or McKenna are dispersed south of the Depot along the roadway and in the wood line vicinity 16SGL057827. A composite mortar platoon of one (1) 120-mm mortar and one (1) (U/I) 82-mm mortar is deployed inside the Depot fence. The battery is dug-in at grid 16SGL054833.

The 1st (Cobo) Platoon maintains a squad-sized force at the McKenna Airfield. This squad supports and secures the airfield facilities, cadre, and maintenance staff. The remainder of the Platoon provides security forces in and around the McKenna Depot and the town and provides the infantry element of the reaction force.

The Company's 2nd (Catanga) Platoon is deployed in the vicinity of the Ochillee Rail Yard (16SGL028860). The platoon secures the rail yard and road and rail crossings and access points in the immediate area.

The Company's 3rd (Hobbo) Platoon is deployed in the vicinity of a logistics support area (16SGL099865). The platoon maintains security checkpoints in vicinity of the road intersection of Hourglass and First Division Roads (16SGL099867) and the road intersection of Red Diamond and Plymouth roads and Helmet trail vicinity (16SGL112847). This Platoon conducts dismounted patrols between the two (2) security points.

McKenna Airfield is occupied by a 20-man detachment from the La Ban Air Services Squadron. This detachment provides local air traffic control duties, light aircraft maintenance, and refueling. The facility contains one of three Gordonian CUDO laser alignment devices. The

system provides calibration and systems alignment for a variety of ATGM and artillery laser designation systems and is essential to maintain accuracy for these systems. The CUDO, a 2-meter by 3-meter device with 3 lenses, is maintained in a 40 foot container.

The logistics support area (16SGL099865) is operated by a 20 to 25-man detachment from the Tibor Brigade's supply and services element. The site is believed to be being filled to provide a fuel and ammunition cache site for the Gordonian Army's defense of the Chattahoochee River line.

Observations of exercises of the reaction drills by 3rd Company to the McKenna Airfield indicate use of routes through McKenna. The primary route is the hardtop road direct to the airfield; however, two daylight drills have been observed bypassing McKenna and approaching the Airfield from the East (16SGL072841). No drills approaching from the Depot have been observed, presumably because of fences and gates. Daytime reactions vary from 17 to 20 minutes from alert along the primary route. Night drills are less frequent. The best observed night reaction time was 28 minutes, however, two (2) of the technical vehicles and the infantry support, became disoriented and their arrival was delayed by an additional 10 minutes. Only the main road route has been observed in use during night drills.

One daylight reaction drill from the McKenna Depot to the Ochillee Rail Yard has been observed.

The composite mortar platoon routinely reports ready to fire eight (8) minutes after alert, both day and night. No live fire training or registration firing has been observed by the composite platoon.

Enclosure 8

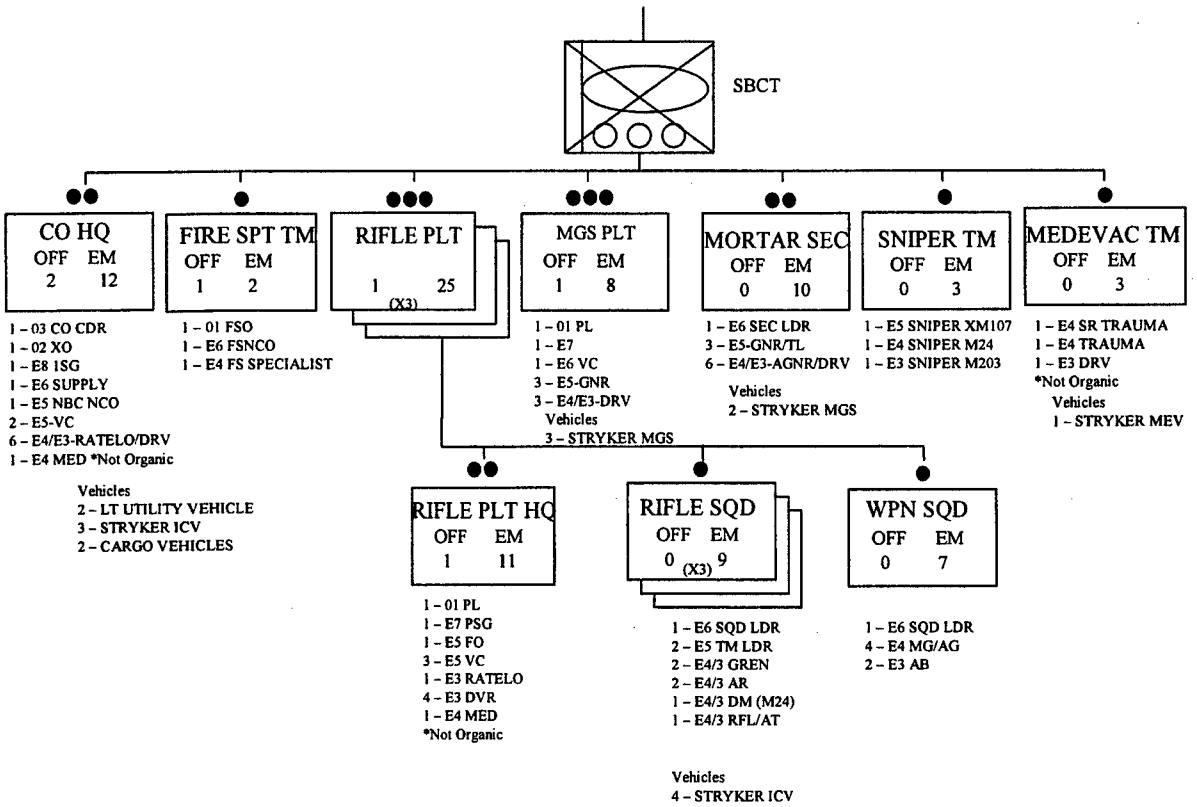


Figure 35. Stryker Company Organization Chart

Enclosure 9

BIOGRAPHIES

Personnel for the Company OPORD

Battalion Commander

Newly assigned because of last commander's recent injury, he is a graduate of West Point and was selected for battalion command ahead of his peers. He is 36 years old, unmarried, and focuses solely on his career. He commanded a Ranger company and has served as the G3 Plans Officer and Battalion S3 in the 82nd Airborne Division. He has a quick temper, but after he vents there is no grudge.

Battalion S-3

He has been married 17 years and has 4 children. He has been the S-3 for nine (9) months. He has been on active duty for 18 years (13 commissioned and 5 enlisted). He tries his best to be the much-needed buffer between the BN Commander and the company commanders.

B Company Commander

This hard charging bachelor loves football and rugby. He was a lieutenant in the 75th Ranger Regiment. His initial assignment in the Battalion was as the S3 Air where he served for a year. He has been in command for 3 months. His NCOs think that he volunteers the unit for too much, but they admire his tactical skills and physical fitness.

C Company Commander

An "old man" of the Battalion, he was near the end of his company command when the battalion was alerted; was quickly extended. With 6 years of enlisted service, he is seasoned and mature. His 18 months as the S4 had a positive impact on the battalion and earned him the respect of his peers. His slow responses often frustrate the Battalion Commander. He is respected for his ability to read the situation and his love and use of supporting fires.

A Company 1SG

He has been on active duty for 17 years and has been the 1SG for two (2) years. He is an excellent field Soldier, but is lacking in garrison responsibilities. The Soldiers not only respect him, but also like him; he is a young Soldier's role model.

1st Platoon

The platoon leader was assigned 30 days before this deployment and has limited field time with this unit. The PSG has been with this unit for 5 years and has been the PSG for the last 1½ years. He was recently promoted to SFC. The platoon, as a unit, has done well in the field in the past, however, the new PL is untested at this time.

2nd Platoon

Solid as a rock, the PL and PSG work very well together. Because of this fact, they are normally the lead platoon for the company and consequently have sustained casualties leaving them undermanned. However, this does not deter them; they feel slighted if another platoon is selected to lead.

3rd Platoon

Middle of the road performers, the PL and PSG get along only because they have to. They are content to let 2nd get all the glory and take casualties. The platoon can be counted on, but will never volunteer for the difficult tasks.

Mortar Platoon / Section

The platoon is without a PL. The NCOIC has the best mortar evaluation in the Battalion. They have won every Brigade mortar competition for the past three (3) years.

STRYKER ONLY MGS (Mobile Gun System) Platoon (9 personnel)

Senior PL with a previous assignment to Korea with a light infantry unit. He has been assigned for two (2) weeks. Your first impression is a good one.

Enclosure 10

OPERATION ORDER (OPORD)
GO1B1

[Company Order Ft. Benning (McKenna Airfield) Mission Indigenous Enemy]

TASK ORGANIZATION
A Co
1st Plt (Stryker)
  Weapons Squad 2d Plt
2d Plt (Stryker) (-)
  ARV-A
3d Plt (Stryker)
Weapons Platoon

1. SITUATION.

a. Enemy: See separate handouts for enemy situation, terrain, and weather information.

b. Friendly:

1) 3d Brigade 50th Infantry Division executes offensive operations against enemy forces in AO MARK west of Columbus to disrupt supply and support operations, isolate JTF 626 objectives, and deny the enemy freedom of movement.

2) 1st Battalion 47th Infantry will move to and secure McKenna Airfield vicinity 16SGL0683 and deny the enemy access to the airfield and critical resources.

3) B Co attacks and secures OBJ ROCK (16SGL055829) and establishes a blocking position to prevent enemy approach from the southwest.

4) C Co is the battalion reserve and follows A Co. C Co is prepared in priority to assume the A Co mission, reinforce B Co, or establish a blocking position vicinity checkpoint 6 (16SGL054856) or vicinity checkpoint 3 (16SGL084849) to deny enemy forces from approaching OBJ BETWEEN.

2. MISSION. A Company, 1st Bn 47th Inf will attack and secure McKenna Airfield vicinity 16SGL0683 NLT 130400SJUL04 to deny the Gordonian Army's La Ban Militia access to the airfield and render all aircraft on site temporarily inoperable and destroy the laser alignment device.

3. EXECUTION.

Intent: My intent is to move quickly and employ surprise. We will allow B Co to initiate their supporting attack to draw the enemy's reaction, then seize the McKenna Airfield. Our initial

focus will be to secure the buildings and facilities. We will employ a platoon reserve to block enemy elements out of the B Co sector or deal with unexpected threats from McKenna that attempt to reinforce the enemy, disrupt our mission, or counterattack. We will consolidate rapidly and secure the airfield, rendering any aircraft onsite TEMPORARILY inoperable and destroying the CUDO laser alignment device. Available fires will be employed to destroy the enemy's ability to react or, if we are compromised early, to destroy advancing counter attack forces before they can influence our mission.

a. Concept of operations:

1) Maneuver: The Company will be second in the order of movement following B Co and move to an assault position vicinity 16SGL065845 to await the securing of OBJ ROCK vicinity 16SGL053833. Our main attack will be to seize the airfield maintenance area and helicopters (16SGL060836) on the company's right. The supporting effort will be to seize the eastern end of the airfield and seal the eastern approaches into our area of operations (16SGL070838).

2) Fires: Priority of fires will go to 2nd Platoon initially, then to 3rd Platoon if committed. The battalion has 2 x F-16's with a total of 8 laser guided MK81 500lb bombs on station vicinity Pine Mountain, GA beginning at 0100 until 0430. Reaction time to the area is 4 minutes. Fires will be directed against the concentration of technical vehicles vicinity 16SGL057827 when ground contact is initiated or our attack is discovered or movement compromised. Priority targets: technical vehicles and infantry concentrations in that order.

b. Tasks to maneuver units:

1) 1st Platoon:
   a. Move to Assault Position BAKER NLT 130400SJUL04.
   b. Cross PL PUMA on order.
   c. Conduct the supporting attack on the company left to seize OBJ DINGO (16SGL070836).
   d. Maintain contact with 2nd Platoon and control your fires.
   e. Maintain a squad reserve initially until we see if a fight develops.
   f. Render any aircraft on the eastern portion of the airfield temporarily inoperable.
   g. First in order of the company movement.
   h. Consolidate the perimeter from 2 to 6. You have the most dangerous sector with the potential for mounted, dismounted, and sniper threats from McKenna or the left flank.

2) 2nd Platoon:
   a. Ensure that a mission is programmed and set for the ARVA prior to 130400SJUL04.
   b. Move to Assault Position ABLE NLT 130415SJUL04.
   c. Cross PL PUMA on order.
   d. Conduct the main effort on the company right and seize OBJ FOX.

e. Destroy the CUDO laser alignment device.
f. Secure any aircraft on the parking ramp.
g. Move quickly, but do not loose control.
h. Maintain contact with B Co and 1st Platoon.
i. Second in order of company movement.
j. Consolidate the perimeter from 6 to 9.
k. Coordinate fires with B Co upon completion of consolidation and organization.

3) 3rd Platoon:
a. Remain north of PINE TREE ROAD until 2d Platoon has crossed PL PUMA.
b. Company reserve and follow 2nd Platoon. Keep your element out of small arms range.
c. Be prepared to assist 2nd Platoon or assume their mission.
d. You have potential to be the least engaged platoon, however if either B Co or 2nd Platoon has problems be prepared to be committed to the west quickly until OBJ FOX is secure.
e. Once OBJ FOX is secure, be prepared, on order, to be committed to the east near CP6, should a viable threat develop from that direction.
f. Consolidate from 9 to 2.

4) Mortars:
a. Move with 1st Platoon initially to Assault Position BAKER.
b. Support from Assault Position BAKER vicinity 16SGL065844 initially.
c. Move on order by echelon to vicinity 16SGL063837.

c. Coordinating instructions:

1) PL PUMA is the LD/LC.

2) Commanders Critical Information Requirements (CCIR):

(a) Priority Intelligence Requirements (PIR):
-Will Gordonian forces reinforce the McKenna Airfield or the Depot? If so, when and with what forces?

-Will the enemy disperse or move the armor and technical vehicles located at GL057827? If so, when and to what location(s)?

(b) Essential Elements of Friendly Information (EEFI):
-The time of our attack, routes, and location of our objectives.

3) Rules OF Engagement (ROE):

(a) No small arms will be fired within or into the built-up area of McKenna without positive identification of a hostile target.

(b) No indirect fires larger than 81-mm may be used within 150-meters of McKenna.

(c) Detain and report any civilians encountered along movement routes. Civilians will be released on my order after the mission is completed.

4) Disable aircraft by removing valve stems to deflate tires and place chains and locks on tail rotors of helicopters.

5) Control fires into and toward McKenna Village. Observe the ROE. Report observed or suspected enemy activity in the Village ASAP.

6) All company Bradleys to provide support by fire from the defilade just below the ridgeline south of the assault position.

4. SERVICE SUPPORT.

a. Medical evacuation: Aerial MEDEVAC is available with a 20-min reaction time. Establish MEDEVAC PZ/LZs away from troop concentrations to avoid compromise and targeting.

b. Supply: Classes I, V, and VIII are available on site for immediate supplemental draw. Emergency resupply only will be available until 1600 hours tomorrow.

5. COMMAND AND SIGNAL.

a. Command:

1) Command Group will move with 2nd Platoon initially.

2) Succession of command is XO, 2nd PL, and 1st PL.

b. Signal:

1) SOI in effect.
2) Company Command Net.
   a. Company Commander – W2S10.
   b. 1st Platoon Leader – P9A32.
   c. 2d Platoon Leader – T4A32.
   d. 3d Platoon Leader – W2A32.
   e. Weapons Platoon Leader – B1A32.
   f. Fire Support Fusion Center – Y7Y29.
3) 2d Platoon Net
   a. Platoon Leader – T4A32.
   b. 1st Squad Leader – R9V45.
   c. 2d Squad Leader – L8T45.

d. 3d Squad Leader – P3P45.

2) Challenge and password: DOOLITTLE---FISH

3) Code words for this operation:

(a) Crossed PL PUMA: MOUNTAIN
(b) Crossed PL TIGER: KITTY
(c) OBJ FOX secure: ROULETTE
(d) OBJ DINGO secure: DAGGER
(e) OBJ ROCK secure: BANJO
(f) Number combination: 11
(g) Running password: GONE HUNTING

4) Pyrotechnics and visual signals for this operation:

(a) Green Star Cluster—Lift and shift fires
(b) White Star Cluster—Objective Secure, consolidate and reorganize
(c) Red Star Cluster—Need MEDEVAC

Enclosure 11 Operations Overlay

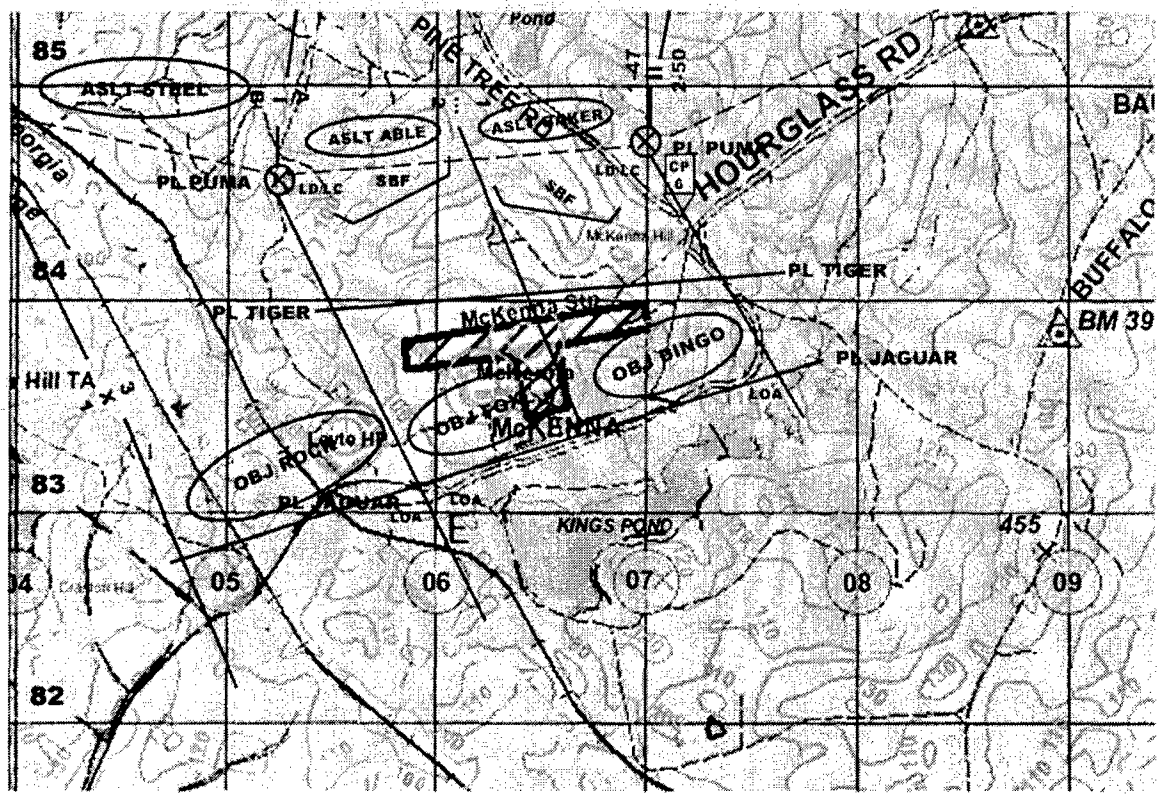


Figure 36. Operations Overlay

Enclosure 12

Communications Plan

1. Nets. There need to be two nets established in the simulated radio net.
    a. Company Command Net.
        i. Company Commander – W2S10 – Battle Master
        ii. 3d Platoon Leader – W4A32 – Battle Master
        iii. 1st Platoon Leader – J8A32 – Battle Master
        iv. Fusion Center (Fire Support) – T2Y29 – Battle Master
        v. Robotics NCO – Q6K40 – OTB Operator
    b. 2d Platoon Net
        i. Platoon Leader – T4A32 – Station 8
        ii. 1st Squad Leader – R9V45 – Station 7
        iii. 2d Squad Leader – L8T45 – Station 6
        iv. 3d Squad Leader – P3P45 – Station 5

2. The Battle Master must be able to monitor both nets, as will Station 8 (Platoon Leader). Squad leaders will only be able to talk and listen to the 2d Platoon net.

3. Jamming and Interference. At the initial outset the platoon net should suffer from jamming and interference. This should only last approximately 10 minutes.

4. Visual signals are covered in the operations order found in Enclosure 3, Scenario, and should be programmed into the SVS Soldier for both the Platoon Leader and Squad Leaders. Also, squad leaders should have a minimum of every 5 rounds for tracers. See Enclosure 5, SVS Soldier Configuration.

Enclosure 13

SVS Soldier Configuration Plan

1. The SVS Soldier Configuration is required to allow proper programming for the Platoon Leader and Squad Leaders.

2. Platoon Leader:
    a. Weapon: M4 carbine, rounds 210.
    b. Flares: 2 red flares and 2 green flares
    c. Grenades: 4 HE fragmentary grenades, 1 green smoke, and 1 purple smoke.
    d. Enable Compass
    e. Combat ID – same as last three letters of callsign.

3. Squad Leaders:
    a. Weapon: M4 carbine, rounds 320. All tracer.
    b. Flares: 1 red flare and 1 green flare
    c. Explosives: 3 Medium C4 charges
    d. Grenades: 4 HE fragmentary grenades, 3 flash bang grenades
    e. Enable Compass
    f. Combat ID – same as last three letters of callsign.

4. Environment: Controlled by the Battle Master Station. Cloudy, time 0400 hours, wind from the northeast at 5 miles per hour. Exercise speed x1.

Enclosure 14 – Support Plan

1. The following persons are required for the ARV-A Employment Experiment:
2. Research Scientist – responsible for the development of the research plan, and during the experiment observe the experiment and provide any additional input or comments for the logger.
3. SME/Battle Master – responsible for the planning and conduct of the experiment, operating the Battle Master Station, the Artillery Tool, and serving as the subject's company commander. Maintain the pace or tempo of the exercise. Give direction to the subject as a company commander would, and give direction to the OTB operator for other BLUFOR and all OPFOR forces. Give direction to the ViSSA logger operator for good and bad decision points and other comments as required.
4. OTB Operator – operate the OTB and take direction from the Battle Master for the movement and reaction of OPFOR and the BLUFOR not directly involved in the experiment.
5. ViSSA Logger Operator – input comments from the research scientist and Battle Master.
6. Assistant Battle Master – a SME responsible for answering and generating calls from the other platoons on the company command net as indicated by the master events list. Respond as the forward observer and fire control team with the company.

Enclosure 15 Entity Requirements List

OPFOR

NOTE: ID#s are provided to help distinguish between similar entities only.

ID#	Entity	Location	Orientation	Phase	Mission	Expertise
OP311	OPFOR Lt Inf Squad	McKenna Airfield 065837	NE	1	Defend, dug in	25%
OP312	OPFOR Lt Inf Squad	055828	NE	1	Defend, dug in	25%
OP313	OPFOR Lt Inf Squad	064836 in building at McKenna	NE	1	Defend	25%
OP332	OPFOR Lt Inf Squad	063842	NE	1	Defend, dug in	25%
OPTV1, 2	Technical vehicle, pickups with heavy machineguns	Patrol from 057827 to 075840 to	NA	1	Patrols	25%
OPTV3, 4	Technical vehicle, pickups with heavy machineguns	057827	East	1	Defend	25%
OPTV5, 6	Technical vehicle, pickups with heavy machineguns	058828	East	1	Defend	25%
OPCP2	GAZ69 Jeep	057827	South	1	Defend	25%
OPCP4	GAZ66 Truck	057827	South	1	Defend	25%
ID#	**Entity**	**Location**	**Orientation**	**Phase**	**Mission**	**Expertise**
OPCP5	GAZ69 jeep	064836 Parked on street near building	NE	1	Defend	25%
OPCP7	GAZ66 truck	064836 Parked on street near building	NE	1	Defend	25%
OPCP10	Company Commander	Walking around	NA	1	NA	25%

		town				
OPCP11	Company first sergeant	Walking around town	NA	1	NA	25%
OPAF2	Container	Southern side of airfield 064836	NA	1	NA	25%
OPAF4	GAZ69 truck	Parked on south side of airfield 064836	NA	1	NA	25%
OPAF6	MI-8 HIP	Parked on south side of airfield 066836	NA	1	NA	25%
OPAF7	MI-8 HIP	Parked on south side of airfield 065837	NA	1	NA	25%
ID#	**Entity**	**Location**	**Orientation**	**Phase**	**Mission**	**Expertise**
OP311	OPFOR Lt Inf Squad	McKenna Airfield 065837	NE	2	Defend, dug in	25%
OP312	OPFOR Lt Inf Squad	055828	East	2	Defend, dug in	25%
OP313	OPFOR Lt Inf Squad	064836	NE	2	Defend	25%
ID#	**Entity**	**Location**	**Orientation**	**Phase**	**Mission**	**Expertise**
OP332	OPFOR Lt Inf Squad	Bridge at 063842	NE	2	Defend, dug in	25%
OPTV1, 2	Technical vehicle, pickups with heavy machineguns	Patrol from 057827 to 075840	NA	2	Attack BLUFOR at McKenna 073835	25%
OPTV3, 4	Technical vehicle, pickups with heavy machineguns	057827	East	2	Attack BLUFOR at McKenna 063835	25%
OPTV5, 6	Technical vehicle,	058828	East	2	Defend	25%

	pickups with heavy machineguns					
OPCP2	GAZ69 Jeep	057827	South	2	Move to 065845	25%
OPCP4	GAZ66 Truck	057827	South	2	Move to 065845	25%
OPCP5	GAZ69 jeep	064836 Parked on street near building	NE	2	Move to 065845	25%
OPCP7	GAZ66 truck	064836 Parked on street	NE	2	Move to 065845	25%
ID#	**Entity**	**Location**	**Orientation**	**Phase**	**Mission**	**Expertise**
OPCP8	OPFOR Lt Inf Squad	In building on east end of town	East	2	Defend	25%
OPCP9	OPFOR Lt Inf Squad	In building on east end of town	East	2	Defend	25%
OPAF1	3 squads of light infantry	Walking around airfield between trailer and air craft	NA	2	Defend	35%
OPAF2	1 ton trailer	Parked on southern side of airfield	NA	2	Depart to the north out of the area	45%
OPAF4	GAZ66 truck	Parked on south side of airfield	NA	2	Depart to the north out of the area	45%
OPAF5	GAZ69 truck	Parked on south side of airfield	NA	2	Depart to the north out of the area	45%
OPAF6	MI-8 HIP	Parked on south side	NA	2	Take off and depart	100%

		of airfield			to the north	
OPAF7	MI-8 HIP	Parked on south side of airfield	NA	2	Take off and depart to the north	100%
OP311	OPFOR Lt Inf Squad	McKenna Airfield 064836	NE	2	Defend, dug in	25%
OP312	OPFOR Lt Inf	057827	East	2	Defend, dug in	25%

BLUFOR (other than SVS Soldiers)

ID#	Entity	Location	Orientation	Phase	Mission	Expertise
BCL21S	Stryker	065845	S	1	Move to SBF Position	100%
BCL22S	Stryker	065845	S	1	Move to SBF Position	100%
BCL23S	Stryker	065845	S	1	Move to SBF Position	100%
BCL21	9 man infantry squad	065844	S	1	On line – prepared to attack	100%
BCL22	9 man infantry squad	065844	S	1	On line – prepared to attack	100%
BCL23	9 man infantry squad	065844	S	1	On line – prepared to attack	100%
BCL1ARVA	ARV-A 1st Platoon (6M Recon vehicle)	065844	S	1	On line – prepared to attack	100%
BCL31S	Stryker Platoon	065845	S	2	Move to SBF Position	100%
BCL11S	Stryker	065845	S	2	Move to SBF Position	100%
BCL21S	Stryker	065845	S	2	SBF	100%
BCL22S	Stryker	065845	S	2	SBF	100%
BCL23S	Stryker	065845	S	2	SBF	100%

ID#	Entity	Location	Orientation	Phase	Mission	Expertise
BCL21	9 man infantry squad	065844	S	2	Attack to McKenna Airfield 062835	100%
BCL22	9 man infantry squad	065844	S	2	Attack to McKenna Airfield 062835	100%
BCL23	9 man infantry squad	065844	S	2	Attack to McKenna Airfield 062835	100%
BCL1ARVA	ARV-A 1st Platoon (6M Recon vehicle)	065844	S	2	On order move to where Platoon Leader directs	100%

TAB J – Available Scenarios Using the Scenario Generation Package

1. Purpose. To provide research scientists and battle masters the matrices of possible scenarios available through the Scenario Generation Package (Wampler, et al, 2004) to allow them to build a scenario for experiments to assess and train leadership skills. There are two geographic areas available, the McKenna Military Operations in Urban Terrain (MOUT) Site at Fort Benning, Georgia, and the National Training Center at Fort Irwin, California. The matrices in this TAB show the possible mixes available and how to tag them.
2. Table 3 shows the Fort Benning matrix.

Table 3. Fort Benning Scenario Matrix.

AO	Section	Site	Options	Enemy
Fort Benning, Ga. (G)	Terrain (T)	1	(A) Ft. Benning Terrain Analysis for Airfield (includes map with overlay)	X
			(B) Ft. Benning Terrain Analysis for Site (includes map with overlay)	X
	Weather (W)	1	(A) January	X
			(B) July	X
	Light (L)	1	(A) January	X
			(B) July	X
	Enemy Forces (E)	1 (AF)	(A) Indigenous	X
			(B) Conventional	X
		2 (Site)	(A) Indigenous	X
			(B) Conventional	X
	Friendly Forces (F)	1	(A) Lt Inf (Current) A Co, 2-50th Inf, 3rd Bde, 12th Inf Div	X
			(B) SBCT (Stryker) C Co, 2-21st Inf, 1st Bde, 24th Inf Div	X
			(C) Future Force	X
	Bios (B)	1	(A) (Platoon operation) Co Cdr, PSG, SLs for 1, 2, 3, & Wpns, and Attachments	X
			(B) (Company operation) Bn Cdr, S3, Co 1SG, Synopsis for each Plt	X
	Orders (O)	1 (AF)	(A) Battalion Order	(1) Indigenous
				(2) Conventional
			(B) Company Order	(1) Indigenous
				(2) Conventional
		2 (Site)	(A) Battalion Order	(1) Indigenous
				(2) Conventional
			(B) Company Order	(1) Indigenous
				(2) Conventional
	Incident List (I)			X

3. Table 4 shows the National Training Center matrix.

Table 4. The National Training Center Matrix.

AO	Section	Site	Options	Enemy
National Training Center (N)	Terrain (T)	1	(A) NTC Terrain Analysis for Airfield (includes map with overlay)	X
			(B) NTC Terrain Analysis for Site (includes map with overlay)	X
	Weather (W)	1	(A) January	X
			(B) July	X
	Light (L)	1	(A) January	X
			(B) July	X
	Enemy Forces (E)	1 (AF)	(A) Indigenous	X
			(B) Conventional	X
		2 (Site)	(A) Indigenous	X
			(B) Conventional	X
	Friendly Forces (F)	1	(A) Lt Inf (Current), A Co, 2-50th Inf, 3rd Bde 12th Inf Div	X
			(B) SBCT (Stryker) C Co, 2-21st Inf, 1st Bde, 24th Inf Div	X
			(C) Future Force	X
	Bios (B)	1	(A) (Platoon operation) Co Cdr, PSG, SLs for 1, 2, 3, & Wpns, and Attachments	X
			(B) (Company operation) Bn Cdr, S3, Co 1SG, Synopsis for each Plt	X
	Orders (O)	1 (AF)	(A) Battalion Order	(1) Indigenous
				(2) Conventional
			(B) Company Order	(1) Indigenous
				(2) Conventional
		2 (Site)	(A) Battalion Order	(1) Indigenous
				(2) Conventional
			(B) Company Order	(1) Indigenous
				(2) Conventional
	Incident List (I)			X

4. As an example of how to use this matrix, to refer to the OPFOR situation for the Fort Benning scenario that uses indigenous forces and the BLUFOR mission situation to seize the airfield, the OPFOR situation would be referred to as GE1A. The operations order that would go with this scenario for a company size operation would be GO1B1. If the friendly force were to be a Stryker unit, the name would be GF1B. If it were future force and at the NTC it would be NF1C. The code NT1A would refer to terrain concerning the airfield. NW1B would refer to weather in July.

5. The scenario for the sample provided in this user's manual is shown in matrix form in Table 5.

Table 5. Sample Scenario in this User's guide.

Terrain	GT1A
Weather	GW1B
Light	GL1B
Enemy Situation	GE1A
Friendly Situation	GF1B
Bios	GB1A
Orders	GO1B1
Incident List	GI

TAB K – References

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